UNIVERSITY
OF TASMANIA

A NEW APPROACH FOR QUALITY MANAGEMENT

FOR SEAPORTS INTEGRATED IN SUPPLY CHAINS

by

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B.A., M.Sc

Submitted in fulfilment of the requirements for the
degree of Doctor of Philosophy

Australian Maritime College

June 2013

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ABSTRACT

Quality management has proven to be one of the most effective methods for organisations to be successfully sustainable in a hyper-competitive environment. However, this management method has not been fully utilised by seaports, especially in the context of global supply chains. This thesis argues that the increasing integration of seaports into supply chains requires a new approach to quality management to enable seaports enhance their own performance and the efficiency of the whole supply chain, in which they are involved. Thus, the objective of this thesis is to investigate *what quality management practices are appropriate for seaports as they become further integrated in supply chains?*

Employing deductive and inductive reasoning and a two stage methodology, this thesis proposes a literature-based quality management framework for seaports, beyond the quality management standards proposed by the International Organisational for Standardisation (ISO), to incorporate both internal and external approaches. An empirical study is used to test the quality management framework in the context of Vietnam, which is a prime example of seaports that are integrating into their supply chains as a result of implementating significant governmental policies on trade, transportation and supply chain.

The first stage of the empirical study was conducted via a preliminary mail survey with 100 seaports to test the initial quality management framework. A 38 per cent response rate was achieved. This stage suggested that the current quality management approach tended to be internally focused and insufficient for seaports that are broadening their business to incorporate supply chain thinking. Therefore, based on the outcomes of the preliminary survey and further examination of the

supply chain literature, a quality management framework consisting of eight external and four internal practices was developed for further testing.

A telephone interview survey with senior managers of 43 major Vietnamese seaports was conducted during the second stage. A 79 per cent response rate was achieved. The findings confirmed that although the internally focused ISO quality management approach has benefits, it is insufficient when considering the contemporary supply chain focus of seaports. Customer focus and leadership were perceived as the most important practices among the internal practices. The findings also indicated that the external practices were perceived increasingly important as seaports become more embedded in various supply chains. Among the external practices, quality integration and network optimisation were considered essential to increase the quality of collaboration and inter-relationships to minimise the complexity of supply chains. To manage supply chain flows and to share the mutual benefits and risks between seaports and other stakeholders, it is suggested that one linked intra-network will need to become the backbone of supply chains.

The empirical study also found that as seaports attempt to increase their sphere of influence in enhancing quality management throughout the supply chains, the business reality of implementing requires significant communication and collaboration among their stakeholders. This requires a stage approach to implementing quality management by the seaports: firstly collaborating with stakeholders who have the most direct relationship with seaports followed by the indirect stakeholders and so on along the supply chains.

The thesis has several contributions; firstly, it readdresses the importance of quality management and provides a broader approach which includes external dimensions

appropriate for contemporary businesses with a supply chain focus. Secondly, the empirical study conducted in Vietnam may draw attention of seaport management to implementing quality management as an economical and powerful means for long term sustainability. This may assist seaport management in preparing effective, competitive Vietnamese seaports for the future. Thirdly, for seaports in developing countries dominated by central governments, quality management is more than just attaining certification and should be embedded in an organisational culture and along a supply chain. The empirically tested quality management framework, although validated in Vietnam, also provides underlying principles that may be appropriate in other countries. Fourthly, a two stage methodology was found useful for explorative research. The outcomes of the first stage were able to provide initial feedback from respondents to enhance the quality of the second stage by sharpening the focus, and enabling further probing result in much greater insights. Finally, this thesis found telephone interviews to be an ideal means of collecting data from senior management due to their flexibility, cost effectiveness and convenience for respondents.

ACKNOWLEDGEMENTS

I would like to acknowledge the people who have given me a great help and encouragement throughout this special journey. The thesis would not have been possible without the constant, endless and faithfull support of you all.

First and foremost, I own my deepest gratitude to my main supervisor, Dr. Stephen Cahoon for his knowledge, enthusiasm and patience in guiding me to achieve my dream. His valuable experiences and guidance deepened my insights in this study. It has been wonderful for me to be his student.

My heartfelt appreciation goes to my second supervisor Dr. Peggy Chen who has supported me in many different ways like a real friend. Her encouragement and direction have always kept me on track, especially in difficult times. I would like to express my sincere gratitude to my initial supervisor, Adjunct Professor Devinder Grewal and my spiritual friends ‘parachute’, Assistant Professor Vinh Thai, Dr. Owen Nguyen for your trust, inspiration and unconditional support.

I am also grateful to Dr. Ben Brooks, Dr. Eon Seong Lee, Dr. Elizabeth Vagg for your kind support regardless of your busy schedules. My special thanks is to the staff of Department of Maritime and Logistics Management for their kind sharing expertise and grateful assistance, to my colleagues Indika Sigera, Imanuel Dindin, Quazi Sakalayen and Mahinda for the lovely sharing research environment we had.

Finally, I am indebted to my Mum and Dad for their endless love, scarification and constant belief in me. I dedicate this thesis to my parent, my beloved daughter and son, who are a great great source of nutrition and challenge to me.

LIST OF ACRONYMS

DWT	Deadweight tonnage
EDI	Electronic data interchange
EFQM	European Federal Quality Management Awards
EM	Excellence Models
GDP	Gross domestic product
ISM	International Safety Management Code
ISO	International Standard Organisation
ISPS	International Ship and Port Facility Security Code
IT	Information technology
JIT	Just-in-time
KPI	Key performance indicators
MOT	Ministry of Transport of Vietnam
PRQ	Primary research question
QA	Quality assurance
QC	Quality control
QI	Quality inspection
SD	Standard deviation
TEU	Twenty foot equivalent unit
TQM	Total quality management
UNCTAD	United Nations Conference on Trade and Development
VINALINES	Vietnam National Shipping Lines
VINAMARINE	Vietnam Maritime Bureau
VPA	Vietnam Port Association
WTO	World Trade Organization

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CHAPTER ONE

INTRODUCTION

1.1 Research background

A rapid growth in international trade positively affects all aspects of society: the quality of products and services improved, the economy enhanced and the average living standards improved (Pokrovskii 2011). The production process of a product is no longer limited to one single country but has expanded to a global scale. This means that organisations are facing greater competitive pressures and are compelled to find a means to be sustainable either by merging, consolidating or changing their management methods. One of the solutions that organisations may adopt is to integrate with their supply chains. The success of the current global supply chains such as WalMart, IKEA or Coles supermarket (Simchi-Levi *et al.* 2008; Wang *et al.* 2007) is testimony to the effectiveness of this type of organisations.

Similar to other organisations, seaports are facing a number of challenges resulting from the hyper-competitive business environment. Seaports have a great impact on the regional and national economy (Kurt 2010; Wang *et al.* 2007). Being a gateway to international markets and cultural interchange, for many countries seaports are often considered as a driver of regional and national economic development (Wang *et al.* 2007). For example, in the Western hemisphere, seaports are critical to the financial health of their countries. In 2008, these seaports generated about US$8.6 trillion in economic activity and handled nearly 7.6 billion tons of importing and exporting cargoes. Furthermore, these seaports support tens of millions of jobs including 13.3 million in the United States (Kurt 2010). Seaports are important to a nation's economy, infrastructure and quality of life (Kurt 2010). Given the important role of seaports, implementing a suitable management method to optimise their capability and resources and to maximise the benefits seaports contribute to the society becomes essential.

With their main function of loading, discharging, handling cargoes and connecting different modes of transportation (Wang *et al.* 2007), seaports are naturally situated in supply chains. To remain sustainable and competitive, one means for seaports to consider may be becoming further integrated into their supply chains. In preparation for a successful operation in the supply chains, seaports tend to invest more on adding new buildings, upgrading infrastructure and facilities, installing new technology and providing more value-added activities (Lloyd's List 2009; Song and Van 2009), but seem to ignore the quality of management. In some countries, this investment and expansion of the seaport system are considered wasteful because it is unplanned and unorganized investment. The rapid increase in a number of seaports causes high competition among them. While emphasizing on infrastructure investment, seaports seem to ignore management, which is important to manage seaport system effective. Thus this all lead the seaport system to deficient and ineffective (Nguyen 2008; Thai and Grewal 2005; Vietnam News 2008). Implementing a suitable management method thus becomes crucial for seaports.

Discussing management methods, Evans and Lindsay (2002), Ishikawa (1990), Maguad (2006) and Mehra and Agrawal (2002) suggeste that quality management is one of the most effective methods for organisations to be competitive. In these authors views quality management plays an important role in business management activities. At the national level, quality has a strategic importance as it creates a competitive advantage for exporting, reduces national trade deficits, increases economic and trade growths and establishes trade standardisations (Claver *et al.* 2003; Ishikawa 1990). At the organisational level, quality is an 'important force leading to the economic growth of companies in international markets' (Feigenbaum 1982, p. 22), and imperative for the long term survival and competitive success of an organisation (Mehra and Agrawal

2002; Maguad 2006). Quality management potentially provides organisations a sustainable competitive advantage and improves organisational performances (Anderson *et al.* 1999; Powell 1995; Terziovski and Samson 1999; Zhang 2000). Juran one of the pioneers in quality predicted that the '21st century may well become known to historians as the century of quality' due to the strategic importance of quality management (Bisgaard 2008, p. 392).

Despite the advantages of quality management, its implementation appears to be limited in seaports. Some seaports reported failures in implementing quality management in their activities especially in relation to environmental quality management (Antoniou and Stamatiou 2008). Instead of building a quality culture from the top to the bottom across the whole organisation, many seaports implement ISO quality standards in only some of their operational processes (UNCTAD 1998). Therefore, the true benefits and premium of quality management cannot be seen. In addition, the high cost of installing berth and terminal facilities to meet the requirements of international accreditation standards and of annual external assessment organisations deter seaports from implementing quality management (Tran *et al.* 2012). According to Ly (2009), seaports in developing countries implement quality management to attain certification from the International Standards Organisation (ISO) for access to international trade. In such case, the implementation of quality management is for the sake of gaining accreditation rather than for long term sustainability and comparative advantage. Therefore, finding a suitable quality management system becomes crucial for seaports. It is especially true when seaports are changing their organisational structures to become a critical part of the supply chains.

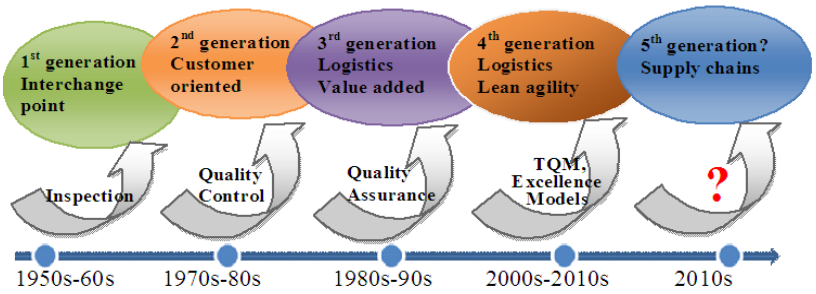
The evidences in the literature show that both quality management and seaports have evolved through different stages (Bisgaard 2008; Beresford *et al.* 2004; Martin-Castilla and Rodrigo 2003; Paixao and Marlow 2003; UNCTAD 1992). Seaports have developed through four generations, from an interchange point between sea and land in the first generation (Beresford *et al.* 2004; Paixao and Marlow 2003; UNCTAD 1992) to cargo transformation and being a commercial service in the second generation. Their activities have continued to expand from a distribution centre in the third generation to being a part of the logistics network in the fourth generation and a node in supply chains (Carbone and De Martino 2003; Cuadrado *et al.* 2004; Heaver 2006; Notteboom and Winkelmans 2001). The current development of seaports is beyond a single operator (Notteboom and Winkelmans 2001; Carbone and De Martino 2003; Heaver 2002; Cuadrado, Frasquet and Cervera 2004). Bichou and Gray (2004) suggested that a seaport is a place merging all nodal links from commodity manufacturers to the end customers. Rodrigue and Notteboom (2008) state that seaports are having a more active role in the supply chains in which seaport terminals are used as distribution centres. Integration of seaports into the supply chains can be seen not only in literature but also in management practice. For example, in the seaport of Rotterdam, multiple logistics service providers and the seaport's own logistics department's cluster in the seaport's distriparks of Eemhaven, Maasvlakte, and Botlek. These advanced distriparks are placed in a strategic location to be able to respond to logistic demands such as 'just-in-time' delivery at low costs, providing value added services to customers (World Bank 2007).

Similarly, quality management has also undergone through different phases: quality inspection, quality control, quality assurance, total quality management, excellence models and lean six-sigma quality (Bisgaard 2008; Martin-Castilla and Rodrigo 2003).

Their practices develop from simple to complex. In initial phase: quality inspection, detection is considered the only quality management practice. In the excellence models and total quality management phase, the practices are expanded and cover different aspects of organisations, for example, operational, process and human resources management (Bisgaard 2008; Martin-Castilla and Rodrigo 2003).

Given their changing role seaports now are more embedded and having more influences over supply chains. This requires seaports to integrate and collaborate with all stakeholders for their mutual benefits (Rodrigue and Notteboom 2008; Simchi-Levi *et al.* 2008). Of vital interest is this question: what quality management will be suitable for seaports in their new generation (see Figure 1.1).

Figure 1.1. Seaport and quality management evolution



Source: Author

Although there is a number of comprehensive studies on quality management across various industries and in business reality many seaports have adopted ISO standards (Beresford *et al.* 2004; UNCTAD 1992; 1998; UNESCAP 2002) there is only a few studies conducted mainly focusing on quality management in the shipping industry (Bichou *et al.* (2007); Cheng and Choy 2006; Hawkins 2001), service quality in seaports (Chlomoudis *et al.* 2005; Myung 2003), or quality management in the logistics industry (Lai, Lau and Chen 2004; Lopez and Poole 1998; Sohal *et al.* 1999). There appears no study on quality management for seaports integrated in supply chains.

Thus, this thesis argues that a more contemporary and appropriate quality management for modern seaports should evolve alongside the development of seaports as a node in supply chains. Quality management of seaports needs to go beyond internal organisational boundaries to encompass the activities of other stakeholders in the supply chains. In other words, the new quality management approach may need to incorporate both internal and external dimensions.

1.2 Research purpose

A comprehensive literature review and business reality shows that seaports are now in the new generation of their development and seaports need to implement a new quality management system that enables seaports to work efficiently and effectively in supply chains. Thus, the purpose of this thesis is to propose a quality management practices for seaports in the supply chains. In particular, the thesis aims to answer the following primary research question (PRQ):

PRQ: *What quality management practices are appropriate for seaports as they become further integrated in supply chains?*

However to answer the primary research question, a secondary research question (SRQ) exploring whether current quality management practices in seaports are still relevant and effective need to be considered. Thus the secondary research question questions:

SRQ: *What quality management practices are currently being implemented in seaports?*

The proposed quality management practices are expected to validate in Vietnamese seaports, which are evidenced in the process of actively integrating into supply chains. Through an empirical study, this study readdresses the importance of quality management, one of the most effective and economical ways for Vietnamese seaports

to be sustainable in the hyper-competitive business environment. This thesis may assist these seaports in preparing for their future to work successfully in supply chains.

1.3 Research structure

The thesis consists of seven chapters. Chapter One addresses the existing concerns facing seaports, the background information that lead to the purpose of this thesis and the research questions. To propose quality management practices, Chapter Two examines seaports and quality management evolution and implementation of quality management in each generation of seaports. Seaports are currently a node in supply chains and have a substantial influence on the efficiency of the networks, thus, Chapter Three reviews the supply chains and their stakeholder relationships including seaports. Based on the discussion of quality management practices used in supply chains, in logistics industry, and the successful integration factors for seaports into the supply chains (Panayides and Polyviou 2011), Chapter Three proposes a quality management practices. These practices are built on the assumption that when working in the supply chains, quality management of a seaport should incorporate internal with external practices. These practices will improve the quality of seaports and at the same time improve the efficiency and effectiveness of the whole supply chain.

Grounded in existing quality management theories, this thesis employs deductive and inductive reasoning for the research methodology approach, which is discussed in Chapter Four. The empirical test to validate the quality management framework was conducted in Vietnam, thus a brief overview of this seaport system including the emerging tendency in its development is also discussed in this chapter. The significant growth of national and international trade through seaports and government related supply chain policies are addressed to justify the choice of these seaports to validate the

framework. Chapter Four also explains how each stage of data collection is designed and conducted, and how bias is controlled. Chapter Five discusses the findings of senior management perceptions on current quality management in seaports and its relevancy in the context of supply chains that addresses the secondary research question. Based on the data analysis, Chapter Six discusses the perceptions of seaport management on the proposed quality management practices, how the attributes of these practices were accepted or rejected. Chapter Seven summarises the main findings, the implications of the results, discusses the limitations of this study and suggests directions for future research.

CHAPTER TWO

QUALITY MANAGEMENT AND SEAPORT EVOLUTION

2.1 Introduction

The main focus of this Chapter is on quality management and seaport development, which extends the discussion on Chapter One. The literature indicates that quality management and seaports have gone through different stages in their evolution because of changes in the business environment (Beresford *et al.* 2004; Martin and Rodrigo 2008; Paixao and Marlow 2003; UNCTAD 1992). In each business environment, quality management practices suitable to that environment are applied (Bisgaard 2008; Martin and Rodrigo 2003). When the business environment changes those practices change accordingly. Thus, this Chapter begins with a review of quality management evolution and the major practices in each of its phases. These practices are then compared to those implemented in the manufacturing and service industries to examine their differences and commonality. The Chapter then examines seaport evolution and the implementation of quality management in each generation of seaports. From the outcomes of these discussions, practices that can be used for seaports in supply chains are proposed.

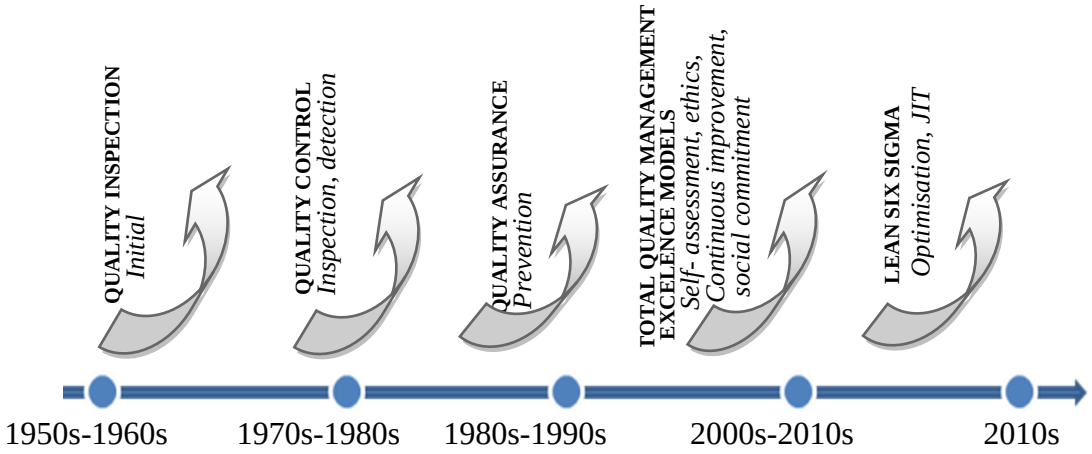
2.2 Quality management evolution

Every organization aims to improve its products and services, increase operational and financial performances, satisfy customer expectations and effectively manage costs and risk. A quality management system gives the tools for organisations to obtain these objectives. Quality management can be applied to all organizations from different sectors: manufacturing, service, public or private, from small as a single department to a large multi-national. The best returns will be gained for companies which implement it throughout their organization rather than in particular departments or divisions. Although quality management originated from manufacturing, it is widely accepted in

other sectors such as military, public and service. Deming (1986), Douglas and Judge (2001), Juran (1951, 1986) and ISO 9001 (2008) define quality management as a method used to increase the quality of products and services. According to Evans and Lindsay (2002), quality management is an effective means for organisations to achieve high productivity, customer satisfaction and excellent business performance. Today, quality management is an essential component of organisational management (Agrawal and Mehra 2002; William *et al.* 2001).

In discussing the development of quality management, Evans and Lindsay (2002), Garvin (1988), Kehoe (1996), Martin and Rodrigo (2003) and Summer (2003) find that quality management has evolved through five phases: quality inspection, quality control, quality assurance, total quality management/excellence models and lean six-sigma, each of which is discussed in depth in the following sub-sections. Quality inspection is the initial stage generally used by small manufacturers for inspecting products (Bisgaard 2008), while lean six-sigma quality is considered as an advanced phase used to eliminate all wastes and optimise the process of production. The development of quality management is illustrated in Figure 2.1.

Figure 2.1. Quality management evolution



Source: Adapted from Martin-Castilla and Rodrigo-Ruiz (2003), Bisgaard (2008)

In each phase of the evolution, different quality management practices are implemented (Martin and Rodrigo 2003; Radnor *et al.* 2006; Zhang 2000). Quality management practices are quality-related activities within a methodological frame for leading and managing an organisation with an aim to continually improve performance over the long-term. They enable organisations to determine, produce, develop and deliverproducts and services to fulfil the expectations of customers and stakeholders (Agus and Sagir 2001; Kaynak 2003; Yusof 2001 and Aspinwall 2001).

As previuosly indicated in Chapter One, the purpose of the thesis is to propose a quality management practices for seaports in their supply chains. Thus, quality management practices in each phase are examined to provide a foundation, from which the relevant practices will be selected.

2.2.1 Quality inspection

Quality inspection is the initial phase of quality management (Evans and Lindsay 2002; Garvin 1988; Martin-Castilla and Rodrigo 2003). This phase, according to Bisgaard (2008), Evans and Lindsay (2002), Garvin (1988) and Martin-Castilla and Rodrigo (2003) was originally determined by special measures taken by the guilds, which were craft and trade organisations that assessed claims caused by makeshift or shoddy work of apprentices and journeymen in the Middle Ages. In the early stage of quality inspection, quality management was based on observations and measurements to evaluate the conformity of products. Thus, quality management became the responsibility of inspectors (Evans and Lindsay 2002; Martin-Castilla and Rodrigo 2003). However, inspections were not conducted systematically. Quality inspection only worked well when the volume of production is reasonably low (Martin-Castilla and Rodrigo 2003) because the methods of inspections and testing were simple

(Bisgaard 2008; Evans and Lindsay 2002; Martin-Castilla and Rodrigo 2003). This is in line with the study of Garvin (1988), who supports that quality inspection simply involves the inspection of the products at the point of the final process before going to the customers. It lacks a link with efficiency and was hard to implement in a mass production situation. When organisations became larger, the need for more effective operations became apparent. Saraph *et al.* (1989) argue that when a large number of defective products were produced, the scrap or rework cost would be high and quality inspection became discredited.

In 1911, Taylor published his book *The Practices of Scientific Management*, which proposed an effective employment of people in industrial organisations to satisfy the requirements of mass production (Taylor 1911 cited in Evans and Lindsay 2002). In his book Taylor provides guidance for inspection departments on controlling defections, which was the beginning of quality control (Evans and Lindsay 2002).

2.2.2 Quality control

Shewhart (1931) refers to quality control in the book *Economic Control of Quality of Manufactured Product*. He introduces the plan-do-study-act (PDSA) cycle and statistical tools for detecting and fixing problems to avoid faulty products. Edward Deming was inspired by the work of Shewhart and widely applied the statistical methods to varied Japanese industries. From June to August 1950, Deming taught hundreds of engineers and managers in using statistical process control and the concept of quality. The Deming's message to Japanese chief executives was that quality management implementation can reduce expenses while increase quality and productivity. This then led to the well-known quality control (Evans and Lindsay 2002).

Although Deming develops the control quality, Juran is the first author to publish one of the most influential books on quality management, namely the *Quality Control Handbook* in 1951 (Evans and Lindsay 2002). Juran (1951) defines quality control as an activity to verify whether a product meets the standards. According to Juran (1951), quality control focuses on failure detection. It comprises various strategies and methodsto identify the understandarded areas. Quality control answers the questions 'What went wrong?' and 'What can be done to remedy it?' and uses statistical tools for controlling quality (Juran *et al.* 1988, p. 17). Summers (1990, p. 9) argues that quality control is 'going beyond quality inspection by setting up standards for the products and services' and 'ensuring processes to conform to these standards, taking action if there is any lack of conformance to the standards'. Quality control includes operational techniques and activities to ensure that the quality requirements are fulfilled. Quality control is therefore a product-based rather than a process-based approach (Summer 1990). It is applied after the product is made but before it is delivered to the customers (Ishikawa 1990). Quality control incorporates the inspection, rejection and acceptance criteria and takes the required steps to enhance the quality of production (Ishikawa 1990; Summer 1990).

In discussing quality control practices, Deming (1986) and Juran (1951) suggest that customers should be central and therefore training and education are essential for organisations to control quality. The researchers conclude that quality control is ineffective when upper management has not been involved in quality decision making. Thus, the leaders should make a strong effort in finding and eliminating the root causes of defective products and poor quality. This is supported by Ishikawa (1990), who suggests that employees should be trained in using important statistical tools such as process flow charts, check sheets, histograms, pareto distribution, cause and effect

analysis and scatter diagrams to make things right at the first time. From the studies of the above researchers, the quality management practices used for this phase are leadership, employee involvement, detection and quality measurement using statistical tools and education and training.

Even though quality control is an extension of quality inspection, it is more suited to manufacturing than service industries. Its documented and statistical tools allow for identification of the problems of production, and use a testing programme to eliminate poor quality issues. In the views of Evans and Lindsay (2005) and Westgard *et al.* (2009), quality control is a hard science and product-oriented, rather than process-oriented where prevention provides the right environment for ensuring quality of the final products. Garvin (1988) argues that quality control uses statistical tools to find defective products with low cost and time, but it still has no mechanism for the prevention of mistakes in the first place, thus a need to further extend quality management is required.

2.2.3 Quality assurance

A dominant influencer in the quality management field, Juran, in his work in 1986 referred to the philosophy of quality assurance (Evans and Lindsay 2002). According to Juran (1986), quality assurance (QA) is the process to determine that products and services are met the customer expectations. Juran (1986) uses quality planning, quality control and quality improvement for quality assurance. Deming in his studies *Out of Crisis* (1986), *System of Profound Knowledge* and *Fourteen Points* (1993) defines that quality assurance is a set of all planned and systematic activities to assure that right processes are done by the right people to achieve organisational objectives. . It aims to predict and prevent errors before they occur, thus it is product and people involved.

Juran (1986) suggests ten steps for quality control that mostly emphasise customer satisfaction, continuous improvement and process enhancement. Deming adds further practices for quality control such as strategic management, human resources, leadership and a cooperative culture with workers and relationship with suppliers.

Another famous quality management researcher, Ishikawa (1990), remarks that quality assurance actually prevents faults during the production or processing of products. Ishikawa (1990) also states that quality can be assured by various methods, by inspection, by process control or by building quality while developing or redesigning new products and that continuous improvement should be one of its basic practices. To create a true quality assurance system, it is essential to implement a system of group-wide quality controls in which subcontractors, suppliers, distribution centres, after-sale services and all other related companies practise quality control as a single unit (Ishikawa 1990). This is supported by Oakland (2003), who suggests that the prevention of quality problems should be planned and systematically documented. This documentation is a compulsory requirement by the International Standard Organisation (ISO).

In discussing ISO quality assurance, Foster (2007) and Maguad (2006) contend that, because the ISO has similar objectives to quality assurance, which is the prevention of mistakes and errors, ISO standards are associated with quality assurance. ISO establishes the standards for each process and then documents them. In other words, ISO is a subset of quality assurance. The prevention of errors extends throughout all processes to minimise the faults caused during manufacturing. Thus, this quality management phase has become most commonly used among different quality management phases. Currently, ISO has members in 163 countries with over a million organisations worldwide adopting ISO standards (Saizarbitoria 2011). Many of the ISO

members are mandated by their government. Other members are from industry associations. Therefore, ISO members are easily to get consensus on solutions that meet the business and society requirements (ISO 2009). Around 1,064,000 organizations of 178 countries worldwide are using ISO 9001 because it sets the standards not only for quality but management as well.

A number of companies reported that after obtaining ISO certification, their performance and income increase. For example, Calingo *et al.* (1995) comment that ISO certified companies gain better quality and competitive advantage. Rao *et al.* (1997) support that ISO certification impacts positively on leadership, strategic quality planning, supplier relationships and customer satisfaction based on surveys of companies in China, India, Mexico and the United States. They also agree that ISO implementation significantly reduces rework and increases throughputs, productivity and market share. Similar outcomes such as ISO certification increases the employee productivity, goals and morale, while decreasing defects and reworks were observed in England (Chittenden *et al.* 1998), Northern Ireland (Mcadam and Mckeown 1999), Norway (Sun 1999) and North America (Simmons and White 1999). ISO implementation has positive effects on staff retention, opportunities for exports, waste reduction, increase of efficiency and competitive advantages (Brown *et al.* 1998; Gotzamani and Tsiotras 2002).

The widespread implementation of ISO in a number of countries and different industries makes ISO central to quality assurance. Thus, quality assurance practices can be referenced to ISO standards, which cover the following eight major practices (ISO 2009):

(i) *customer focus, which refers to how an organisation conforms and responds to customer requirements;*

(ii) leadership, which refers to the strategies, policies and ability to provide sufficient resources and environment for quality;

(iii) involvement of people, which ensures the competency and qualification of people;

(iv) process approach, which refers to controlling and maintaining processes by documentation;

(v) continuous improvement, which means periodical reviews, audits and correction to improve quality management system;

(vi) a system approach, which means maintaining quality management system;

(vii) a factual approach to decision making; and be

(viii) *mutually beneficial supplier relationships*.

Although ISO quality assurance is widely implemented in the industry, it focuses on documentation, standardisation and accreditation rather than self-assessment or a culture of a whole organisation. Some researchers commend that ISO 9000 certification may have the negative effects on company benefits and profitability (Costa and Lorente 2008; Feng *et al.* 2008; Heras *et al.* 2002), low levels of customer satisfaction (Casadesus and Gimenez 2000) and short-term results of organisational performance (Costa and Lorente 2008). For example, Jimenez and Costa (2009) survey 713 Spanish manufacturing companies with ISO 9001 certification. The results showed that in the first three years, their earnings and return on assets decreased markedly while operating costs over the same period increased. Simmons and White (1999) study 126 American electronics companies and found that the profitability, sales and equity performance and foreign sales, three keyfinancial indexes were not significantly different between the 63 ISO certified and the 63 non-ISO certified companies.

Other examples can be found in the works of Haversjo (2000) in Denmark and Heras *et al.* (2002) in Spain. These authors compared the performance of more 400 organisations before and after certifying to ISO 9001 with a group that had not been

certified. The findings in these two different countries are remarkably similar. The studies indicated that in the first three years, there were no difference in performance between the ISO certified group and the non-certified group. Even certified companies that expanded rapidly may find it difficult to control quality. Similarly, Cobertt *et al.* (2002) and Wayhan *et al.* (2002) use comparable methods to survey small and medium sized enterprises in the United States. It was found that that benefits arising from ISO certification were maintained for four to five years and then declined. These negative effects indicate that ISO is not the perfect choice for every organisation. Currently many seaports around the world are implementing this quality management (see discussion in Section 2.5.3) they may need to review the benefits of using this system.

Nguyen (2008) contends that organisations tend to seek ISO certificates as a ticket of quality to international trade. They implement quality assurance in selective operational areas only, but not always in the whole organisation. It can be a somewhat superficial quality implementation and requires external auditors to assess the quality systems. Moreover, ISO is an accreditation process that requires organisations to renew their certificates regularly. To renew the certificates, organisations must install updated equipment and facilities to meet the new requirements, which are costly and time consuming. Thus, ISO is not the answer for every organisation and could explain the emergence of another phase: total quality management, which focuses on equipping organisations with a self-assessment quality culture from bottom to top (Douglas and Judge 2001).

2.2.4 Total quality management

Feigenbaum (1956) introduces the concept of total quality management (TQM) in the book *Quality Control Practices and Administration*. According to Feigenbaum (1956),

total quality management is a particular organisational approach on how to keep the existing quality standards at a high level while improving quality through the whole organisation. Feigenbaum (1956) proposes a system for integrating quality maintenance and quality improvement. Total quality management also can be found in the studies of Deming (1986), Imai (1986), Ishikawa (1990) and Vuppalapti *et al.* (1995). In these studies, total quality management is defined as an organisation-wide philosophy that requires all employees to engage in continuously improving the quality of products and processes. In this philosophy, quality is a way to determine the attitude and behaviour of everyone in the organisation. Total quality management inspires the development of a quality culture throughout the organisation (Deming 1986; Ishikawa 1990). It is a long-term, dynamic and continuous improvement process with no deadlines and requires significant financial and human resources (Mehra *et al.* 2001).

Similar to quality assurance, total quality management involves a number of practices. There are eight common practices were found in studies of Black and Porter (1996), Dotchin and Oakland (1994), Kaynak (2003) and Sila and Embrahimpour (2002). Most of them are similar to ISO practices, for instance, top management involvement, employment involvement training and education, focus on the customer, management by fact, continuous improvement that can make organisations doing things right in the first time. The final key practice of total quality management is empowerment of employees. In this practice employee are encouraged to be proactive in resolving quality-related problems. Thus, organisational culture becomes the major advantage of total quality management, in which all employees work together in an enthusiastic and nurturing environment. Khan (2003) and Oakland (1989) suggest that, all employees in the total quality management environment shoulb be treated as internal customers because if the internal customers are not satisfied, the organisation will find it difficult

to deliver satisfaction to external customers. Unlike ISO that requires organisations to obtain certificates from an external quality management body, this is not the case for total quality management but instead encourages organisations to develop and implement quality management as part of their culture.

Although total quality management is popular, there has also been criticism of total quality management (Powell 1995). Chan *et al.* (2002) and Yusof and Aspinwall (2001) contend that it is not easy to implement total quality management in many organisations as it does not provide a solid guidance on 'how' to achieve it. Reed, Lemark and Mero (2002) concur that total quality management carries inconsistent meaning across the contexts because it is individually interpreted. This then leads to criticism to what total quality management really means (Boaden 1997; Hellsten and Klefsjo 2000). A number of organisations have failed in trying to implement total quality management. No tangible improvements were achieved although these organisations may allocate many resources on implementing total quality managementaccording to Harari (1997). Total quality management also does not address sufficiently the aspect of ethics and social responsibility, which enhances organisational image. Thus, this leads to the excellence models, which are based on total quality management but address this weakness.

The excellence models are actually quality awards being used in different countries (EFQM 2010). The first award, the Deming Prize, was instituted in Japan in 1981 to recognise the best organisation that has implemented quality. It was then followed by the Malcolm Baldridge National Quality Awards in the United States in 1987, European Quality Awards in European countries in 1991, and the Australian Awards in Australia in 1992 (Maguard 2006; Samuelsson and Nilsson 2002). Currently, approximately 200 national quality awards exist in the world (Foster 2007). Among

them, the Deming Prize, Malcolm Baldridge National Quality Awards, European Quality Awards have the highest profile (Samuelsson and Nilsson 2002).

Even though each country uses its own name for its respective quality award, the assessment criteria are very similar, which are based on ISO and total quality management practices (Lindsay and Evans 2002). Foster (2007) and Summers (2003) state that these criteria are used to determine the current and future market and customer values. These values drive organisational design, strategy, products and services to adapt to market requirements. Ethical, social and environmental responsibilities are added and performance measurements are emphasised more strongly in the excellence models.

The excellence models are used worldwide. However, their criteria do not assess the flexibility of an organisation in quickly responding to changes in the business environment and market complexity. In the current super-competitive market environment, organisations are required to be more flexible, more responsive and more efficient in processes, and thus another quality management system is required, which is lean six-sigma quality.

2.2.5 Lean six-sigma quality

Motorola pioneered the use of six-sigma in the 1970s while identifying the connection between increases in quality and decreases in costs of production (Motorola 2009). The six-sigma applies to a process to identify the root causes of defects (Walsh 2009) and minimise variability in the manufacturing and business processes (Jiji 2008). In six-sigma, 99.99966% of the products manufactured are expected free from defects (Geoff 2001; Reverse *et al.* 2004). In the short term, it can make a significant change in processing and can increase the organisations' financial profits.

The nature of the six-sigma approach is actually a combination of several practices from other quality management phases, mostly from total quality management but is more structured (Anderson *et al*. 2006; Klefsjo *et al.* 2001). The six-sigma approach is a top-down approach, data-oriented, which uses statistical decision tools to measure, analyse, improve and control manufacturing and business processes (Dale *et al.* 2007; Reverse *et al.* 2004). Klefsjo *et al.* (2001) argued that six-sigma has similar common features to total quality management, such as management and employment involvement; continuous efforts to achieve stable and predictable process results; measuring, analysing, and controlling manufacturing and business processes; well achieving sustained quality improvement. However, six-sigma is different to other quality management phases. It clearly focuses on achieving measurable and quantifiable financial returns (Jiju 2008). It uses a special infrastructure for instances 'Champions', 'Master Black Belts', 'Black Belts', 'Green Belts' and 'Red Belts' to implement the six-sigma quality management process. Due to a strong emphasis on using statistical tools, the six-sigma decisions are grounded on analysed data rather than assumptions.

The major components for a successful six-sigma implementation are top management commitment (Eckes 2001; Henderson and Evans 2000), training and statistical tools, monitoring of work progress via a rewarding system, and an assurance that human resources are free to work on high priority areas and maximise process improvement (Walsh 2009). In six-sigma, customer satisfaction, teamwork and leadership are essential requiring an organisation to emphasise *training, communications and relationship skills.*

General Engineering announced in 1998 a saving of more than one billion dollars by the late 1990s as a result of the implementation of six-sigma (Ingle and Roe 2001).

However, six-sigma is mostly applicable to large organisations (Dusharme 2001) and not as appropriate for companies with fewer than 500 employees according to Pyzdek (2001). Six-sigma is an appropriate means to minimise variability and errors in the processes, a large organisation such as a supply chain may find six-sigma suitable.

Similar to six-sigma quality, lean quality is a systematic approach to identify and eliminate unnecessary elements (Hanna 2007; Ruffa 2008). Lean quality was first implemented by Toyota in its production in the 1990s (Hanna 2007) to 'get more with less' by eliminating wastes in all forms of material, people, time and production (Maguard 2006). These wastes may occur in transport, inventory, waiting time, overproduction, over processing moving people or equipment. Lean quality focuses on achieving efficiency through optimising flows, thus leading to perfection and a customer-driven pull process, as well as just-in-time systems to reduce inventory, lead-time and wastes (Ruffa 2008). Consequently, it improves customer satisfaction and adds more value to customers by providing the right product at the right prices at the right time.

In discussing the practices used in lean quality, McCurry and McIvor (2001), Hanna (2007) and Ruffa (2008) claim that some practices are similar to those of total quality management, for example, understanding customer value, continuous improvement, building and maintaining a long term relationship with suppliers. Lean quality emphasises analysing the stream's value and the efficient management of the flows through production. It uses pull systems to prevent a high stock of commodities and eliminate non value-adding elements. Lean quality is a choice suited to many manufacturing and distribution situations. However, when customer demand is unpredictable, lean quality should not apply (Hanna 2007). A variety of approaches to

reduce or eliminate wastes are available including value stream and cost analysis, total product and document management.

Pyzdek (2003) and Taylor (2008) claim that six-sigma and lean quality are usually combined to become lean six-sigma due to their similarities. Firstly, both emphasise the improvement process, where six-sigma seeks to remove the causes of defects, lean quality is used to eliminate wastes. Secondly, lean quality and six-sigma implement a set of statistical tools using to improve quality of processes. The features that make six-sigma different from approaches used in previous phases are that decision-making is based on verifiable data but not assumptions, a greater focus on measurable and quantifiable financial returns, and the use of 'professionalization' through a special infrastructure called 'Black belt' (Karan 2007; Jiji 2008). Lean quality uses smart automation as a tool to improve quality (Matthias 2007). Thirdly, lean quality and six-sigma both aim to reduce costs. Foster (2007) stated that the profits achieved through reducing costs set six-sigma and lean quality apart from the previous traditional quality systems.

The combined lean six-sigma approach creates many advantages for organisations. Six-sigma can provide the cultural infrastructure and management commitment that lean quality lacks. Furthermore, lean quality tools are unable to reduce variations. However, lean quality can support six-sigma by identifying areas that do not provide added value to customers. Lean quality uses automation that can improve productivity and speed in process. Basically, on top of the practices in the previous phases, the combined lean six-sigma approach has other additional practices such as using technology (smart automation) and system optimisation (just-in-time, waste minimisation and professionalization). These practices might be useful for the supply chain management,

where the seamless flow with minimum total cost throughout all processes from the raw material supplier to the end user is essential.

Although lean six-sigma has big advantages, it is claimed to be relying on heavy investment, for example, General Engineering invested more than one billion dollars in its six-sigma system (Antony and Banuelas 2002), time allotment, training and knowledge resources (El-Haik and Al-Aomar 2006). Nearly half (48 per cent) of the organisations, who intended to implement lean six-sigma claimed that they did not have enough resources to properly implement these projects (Dusharme 2001). Lean six-sigma focuses on leanness and accuracy of producing process and less emphasis or lacks the practices that improve the quality of the internal organisation as compared to other quality management phases. It is hard to find in lean six-sigma the practices that help organisations to interact with their partners. Thus, another quality management phase, which can incorporate internal and external dimensions, is called for.

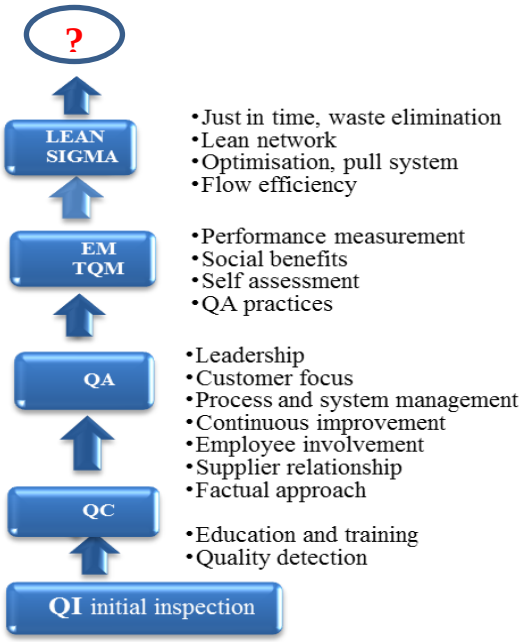
2.3 Quality management practices

The discussion on the different quality management phases shows that similar to the quality management evolution its practices develop from simple to complex. Whist the quality management practices of quality inspection phase are simple and limited in physical inspection; whereas the practices grow more complex in the total quality management and excellence models. These practices are summaried development of quality management practices is described in Figure 2.2.

It can be seen from the Figure 2.2 that total quality management and excellence models practices are based on ISO quality assurance. These practices also are widely implemented in industries (as discussed in Section 2.4) and thus they are selected for designing the proposed framework. This study argues that the lean six-sigma practices

such as network optimisation, technology and automation, and flow efficiency management could be useful in increasing efficiency of cargo flows and clearing the bottlenecks, thus they are also selected for proposing the framework. These practices are then used to compare to those being implemented in seaports and for the design of an initial framework in Chapter Three.

Figure 2.2. The development of quality management practices



Legend: Lean Sigma: Lean Six-sigma
TQM: Total quality management, EM: Excellence models
QA: Quality assurance
QC: Quality control
QI: Quality inspection

Source: Author

In summary: quality management has developed through an evolution from quality inspection, quality control, quality assurance, total quality management, excellence models and lean six-sigma. Their practices accordingly have developed though an evolution from a simple practice ‘detection’ in quality inspection to a complex package in quality assurance, total quality management, excellence models. However, there are major practices such as leadership, customer focus, human resources, process

improvement, quality measurement, continuous improvement, education and training, mutual benefits, optimisation and communication and technology are frequently used (see Table 2.1).

2.3.1 Leadership

Leadership is the most essential and critical factor for the successful implementation of a quality program (Crosby 1980; Deming 1986; Feigenbaum 1956; Garvin 1988). Without top management commitment and leadership, quality-related processes and procedures may not be embraced by the employees. If management commitment and actions are lacking, employees will not see the real value of quality management. In other words, top management must set a good example by first devoting themselves in terms of leadership and commitment to quality improvement. Rao *et al.* (1997) describe top management's commitment as providing active and timely supports to build quality awareness that leads to higher quality performance. This is similar to the views of other quality researchers such as Ahire *et al.* (1996), Flynn *et al.* (1994) and Saraph *et al.* (1989). According to Claver *et al.* (2003), Deming (1986), Juran (1986), Kaynak (2003) and Sila and Ebrahimpour (2002), a leader must have a vision and commitment that focuses on quality efforts to satisfy customer expectations. A leader will determine and set clear long term objectives and strategies as well as short term plans for organisational development. A leader also needs to create quality environment awareness and provide sufficient resources for quality purposes (Ahire *et al.* 1996; Anderson *et al.* 1999; Black and Porter 1996; Sila and Ebrahimpour 2002). In term of customer relationships, a leader needs to consider the interest of all concerned partners, who are customers, suppliers, stakeholders, employees and local communities.

Table 2.1 Summary of quality management practices in different phases

Practice	Quality Inspection	Quality Control	Quality Assurance	Total Quality Management Excellence Models	Lean six-sigma
Leadership		Leadership	Leadership	Leadership	
Customer focus			Customer focus	Customer focus	
Human resource		People involvement	Employment participation	Employment participation	Employee are free to work
Training and education		Training, education	Training, education		Professionalization Competency
Process management			System and factual approach	Process management	Waste elimination, Process improvement
Mutual benefits			Supplier relationship	Ethics, social benefits	
Quality measurement	Inspection	Detection		Performance measurement	Quality measurement
Continuous improvement			Continuous improvement	Continuous improvement	
Communication Technology				Communication Information	Automation
Network optimisation					Lean, JIT, optimisation,

Of interest, Black and Porter (1996) did not include leadership in their study but introduce corporate quality culture.This factor nurtures the company-wide culture committed to quality improvement, in which leadership still has a significant role. According to the literature then the demonstration of leadership, is (i) the long term commitment of top management, (ii) direct responsibility of top management in quality policy, strategies and plans, (iii) comprehensive goal-setting processes for quality, (iv) providing adequate resources to quality improvement efforts, (v) participation of top management in quality improvement process and (vi) encouraging company-wide culture committed to quality improvement.

2.3.2 Customer focus

Satisfying customer expectations are a central objective and a key performance indicator for an organisation. According to Flynn *et al.* (1995), Ishikawa (1990) and Mann (2008), an organisation should ensure an effective response to customer feedback, understand customer values, and manage customer relationship and market research. Customers are the driving force a customer-oriented organisation makes the outputs that meet customer expectations. Feedback and complaints from customers need to be used to improve quality of products and services. A customer-oriented organisation maintains its competitive advantage over others. In these organisations, customer satisfaction is central of organisation actions (Summer 2003; Zeithaml 1981). Customer expectations change over time, a regular survey helps organisation adjust and modify its operations accordingly (Ahire *et al.* 1996). The availability and use of customer complaints indicate the level of an organisation’s customer focus.

Crosby (1980), Deming (1986), Feigenbaum (1956), Garvin (1988) and Ishikawa (1990) suggest that creating and delivering value to customers should be a business

philosophy, and therefore understanding the current customer needs and their future expectations is critical. Customer satisfaction should be measured systematically and documented (ISO 9001 2008). The attributes of this practice are (i) establishing goals that exceed customer expectations, (ii) creating and delivering value to customers as a seaport's business philosophy, (iii) measuring customer satisfaction and loyalty as the seaport's important key performance indicators, (iv) using customer feedback on the seaport's service and treating it as critical input in the quality improvement process, (v) educating employees about customer values.

2.3.3 Human resources

It has been argued in the quality management literature that a total organisation approach to quality management is essential to realise its benefits. Employee involvement and empowerment therefore has a positive impact on employee commitment to quality (Summer 2003). While employee involvement is essential in this respect, employees should be empowered so that they can be involved voluntarily. The successful implementation of quality management requires employee understanding and involvement in conducting quality policies of the organisation, so that quality becomes a culture of the organisation (Chin and Pun 2006; Crosby 1994; Deming 1986; Flynn *et al.* 1995; Ishikawa 1990; Juran 1988). Employees should understand their contribution to organisation and be encouraged to share experience as well as discuss problems (EFQM 2008; Mann 2008; ISO 9001 2008; Ishikawa 1990). They also need education and training to be competent. As a result, organisations should encourage and reward employee involvement in the quality improvement process in the formal systems. This should also include a system to measure employees' satisfaction as this affects their involvement in quality improvement efforts and the success of the organisational outcomes (Deming 1986; Juran 1986; Rao *et al.*

1997). The attributes that can be used to demonstrate this quality management practice are therefore (i) employee participation in quality process, (ii) effectiveness of employee participation in quality decisions, (iii) that employees are encouraged to provide feedback on quality problems, (iv) a reward system in place to recognise seaport employee efforts, (v) responsibility of seaport employees for error free outputs.

2.3.4 Continuous improvement

This is one of the fundamentals of quality management. Quality management should be treated as a philosophy rather than a program; there should not be an end point to this management activity. As customers keep changing their requirements and expectations, it is not realistic for an organisation to exert its quality improvement efforts in a snapshot fashion. Rather, quality improvement should be conducted on a continual basis. An approach to the continual improvement of an organisation's performance according to the Deming Prize (2009), Juran (1986) and Taguchi (1979) is to train staff in the use of continuous improvement methods and tools. Other suggestions are to establish the goals to guide (Crosby 1980; Sureshchandar *et al.* 2001), to measure to track (Black and Porter 1996; Taguchi 1979) and, to recognise and acknowledge improvements (Feigenbaum 1956; Garvin 1988; Ishikawa 1990). Ahire *et al.* (1996), Claver *et al.* (2003) and Kaynak (2003) also recommended setting realistic quality related goals, providing tools, resources and opportunities to people, to contribute to quality improvement. The attributes of this practice can be illustrated as (i) continually monitoring and reviewing organisational policy, strategies, processes and procedures, (ii) using quality improvement teams to facilitate quality improvement efforts, (iii) adopting a formal system and procedure of review for quality improvement and, (iv) identifying areas for improvement.

2.3.5 Process management

It has been acknowledged in quality management literature that in-process control and management is more effective than final inspection at the end of the process. This emphasises the importance of ‘making things right in the first time’ by a systematic search for problems and causes during the producing process (Deming 1986; Flynn *et al.* 1994). According to researchers an organisation should establish, control and maintain documented processes with a focus on the resources, methods and material that can improve activities of the organisation (Claver *et al.* 2003; Juran 1986; Terziovski and Samson 1999). Understanding the system processes and using structured approaches to harmonise and manage processes will help organisations improve processes (Ahire *et al.* 1996; Claver *et al.* 2003). Kaynak (2003) recommends organisations to evaluate the impacts of organisation activities on customers and suppliers. Therefore, business processes in any organisation should be strictly controlled and managed to ensure satisfactory outcomes. As a result, these quality management practices are (i) control and continuous improvement of key seaport processes, (ii) comprehensiveness of quality plans, (iii) strong practice of preventing faulty services, (iv) continuously tracking and fixing root causes, and quality problems.

2.3.6 Education and training

At the organisational level, education and training is considered as a vehicle for implementing and reinforcing quality practice (Reed *et al.* 2002). Ishikawa (1990) states that quality begins and ends with training because quality management is introducing a continuous quality improvement system and thus employee and management levels are required to obtain the knowledge and experiences gained through the process. Training may needto begin with the top management, who

allocates equate training resources to employees (Crosby 1980; Deming 1986; Feigenbaum 1956; Garvin 1988; Juran 1986). The training needs to be continuous (Ahire *et al.* 1996; Anderson *et al.* 1995; Flynn *et al.* 1994; Ishikawa 1990; Kaynak 2003).

Training is an efficient way to increasethe ability of employees to perform better than required (Westgard *et al.* 2009). It has become a prerequisite to achieving world-class status as pointed out by Rao *et al.* (1997). Quality education and training may need to provide to both management and employees so that they can comfortably exercise the above quality factors. This should first begin with the management to allocate resources (Deming 1986). Furthermore, everyone in the organisation should receive training on quality improvement, not just those in the quality improvement committee or team (Ahire *et al.* 1996; Anderson *et al.* 1995). Results of quality measurement and reporting should be used as the proxy for training development in the organisation. These training activities, in addition, are conducted on a continual basis to sustain the capability and commitment of management and employees (Ishikawa 1990; Juran 1986). This practice is demonstrated as (i) training and education for everyone, (ii) the results of quality measurement and reporting be used for training development, (iii) continuous conduct of quality training and education.

2.3.7 Mutual benefits

It is a critical practice to increase the ability of the involved parties to create value. This practice is determined by establishing strategic alliances or partnerships and developing mutual trust, respect and commitment to customers and continual improvement (Ahire *et al.* 1996; Black and Porter 1996; Claver *et al.* 2003; Kaynak 2003; Mann 2008; Steventon 2007). The quality of suppliers is an important practice because the defective

materials will lead to bad quality of products and services. Maintaining a good supplier relationship is a key factor to achieve higher quality, competitive advantage and quickly response to market needs (Flynn *et al.* 1994). The attributes of this practice are explained as (i) employing a supplier management policy, (ii) having an obligation on contributing to the public interest, (iii) employing a clear social responsibility policy towards local community.

2.3.8 Quality measurements

Management decisions are normally based on the the factual data and information gained from procceses. The aim is to minimise cost, improve performance indexesby using suitable methods (ISO 2009; Taylor 2008; Walsh 2009). Thus, an organisation needs to ensure that its data and information are accurate and reliable. Secondly an organisation has its owned key performance indicators for quality measurement (Kumar *et al.* 2009). The use of other quality measurement tools such as internal and external audits is also advisable. In addition, a system of quality reporting from frontline employees back to top management should be in place (Dean and Terziovski 2001). The attributes of this practice are reflected in (i) using key performance indicators (KPIs) for quality improvement (Cui *et al.* 2003), (ii) determining key performance indicators (KPIs) for operations and management, (iii) having a system to record and report quality problems (ISO 2009), (iv) using reports from internal and external audit for quality improvement (Hoang *et al.* 2006) and, (v) ensuring quality of data and reports (Dean and Terziovski 2001).

2.3.9 Lean network

This practice aims to reduce costs and optimising all processes and flows within an organisation. Any wastes such as inventories, overproduction, waiting time in

operational, managerial process and material, information flows should be eliminated (Rao *et al.* 1997; Steventon 2007). An appropriate organisational structure and the proper use of just-in-time management are the key to success (Vuppalapati *et al.* 1995). For fast process and flows, the use of new technology, such as automation, is essential (Maguard 2008; Taylor 2008). Structuring a system to achieve organisation objectives in the most effective and efficient way, reducing cross-functional barriers, as well as continually improving the system through measurement and evaluation will help an organisation obtain an appropriate system optimisation (ISO 2009). The attributes of this practice can be explained as (i) applying a process controlling system to minimise unnecessary wastes, (ii) focusing on cost reduction and, (iii) applying a just in time system (Kanan and Tan 2005).

2.3.10 Communication and information

In any management activities, communication with customers and suppliers is always important. The best organisation recognises the difference between the effectiveness and failure of communication channel thus two-way communication helps foster good relationships between the organisation and its customers and suppliers (Claver and Molina 2003). However, the information from workers, suppliers and customers need to be passed to the top management. In that case the effective decisions with regard to quality matters are able to be made (Rao *et al.* 1997). The attributes of this practice are (i) applying an effective communication and information system, (ii) employing an effective communication channel with customers and suppliers and, (iii) providing technical and operational consultation to customers and suppliers (Bra *et al.* 2000).

2.4 Quality management in service and manufacturing

Although quality philosophies originated from the manufacturing industry and they were initially used for this sector, the service industry today is growing quickly and contributing substantially to the world economy. In the industrialised nations, the service sector has become the dominant element of the economy. For example, according to the US Census Bureau (2012), the service industry accounts for 55 per cent of the economic activities in the United States. Therefore, quality management in the service industry is of special importance.

Sureshchandar *et al.* (2001) argues that the quality management practices of the manufacturing sector can apply to the service sector. However, service companies, in comparison to manufacturing organisations, have some special characteristics that could change the relative importance of management tasks (Haywood-Farmer *et al.* 1985). The provision of a service typically requires a higher degree of customisation than in manufacturing, while the major goal of manufacturing is uniformity (Sureshchandar *et al.* 2001). In the service sector, quality requires more attention because service must be performed at the convenience of the customers. Evans and Lindsay (2002) argue that quality management has been implemented in the manufacturing sector for a long time and focuses on processes including designing, purchasing, and delivering products, planning, inspecting and testing, detecting, measuring and controlling. Therefore quality in the manufacturing sector is more concerned with technical issues. In other words, quality in the manufacturing sector deals with the 'hard parts' of quality management (Boaden 1997). Meanwhile, quality in the service industry which includes real estate, financial services, retailers, transportation, and public utilities, primarily focuses on customer satisfaction and

human resources factors, which are more the ‘soft parts’ of quality management (Evans and Lindsay 2002; Yang 2006).

Comprehensive comparison of quality management implementation in the service and manufacturing industries can be found in the literature. There are two slightly different schools regarding the outcomes of the comparison. The first school states that there is no difference in quality management implementation in both sectors. It is supported by the study of Van De Wiele *et al.* (1993). They selected 358 manufacturing and service organisations and compared the quality management implemented among them. Beaumont *et al.* (1997) surveys 85 service and 261 manufacturing organisations in Australia and the findings were in line with the outcomes of Van De Wiele *et al.* (1993). Prajogo (2005) conducts a research on 103 manufacturing and 91 service organisations in Australia and Cheah *et al.* (2009) surveys 129 service and 79 manufacturing organisations in Malaysia. The results in both studies concurred with this school of thought.

The other school assumes a small difference in quality management between the service and the manufacturing industries. The study of Powell (1995) serves as one example. The researcher surveys organisations in north-eastern United States. He found that manufacturing organisations more effectively implemented quality tools and procedures than their service counterparts. Woon (2000), who researches 129 manufacturing and 111 service organisations in Singapore, confirmed that manufacturing organisations had a higher level of quality implementation than service ones. Based on a comprehensive review of literature on quality management and the practices of quality awards mainly in the manufacturing sector, Lagrosen and Lagrosen (2003) empirically develop and validate eleven constructs for quality management for the service sector. They are process management, participation, teamwork, training,

outcome measurement, compensation, benchmarking, training management, empowerment, technology and assessment. By comparing with other empirical quality management studies, these authors identified several distinct quality management constructs that relate to human resources management for instances compensation, participation and assessment.

It seems that there is no significant difference in quality management between the two sectors (Cheah *et al.* 2009; Prajogo 2005), except that the service sector emphasises more on 'soft practices', meaning the quality of human performance such as employee empowerment, participation, education and training and leadership commitment and direct involvement. Quality management in the manufacturing industry focuses on the 'hard part', which are operation, process and system.

These common selected practices are then used to compare with those being used in seaports (discussed in the next section) to examine whether seaports may require the different practices. Reviewing and comparing quality management practices in seaports provides a background and direction to propose the quality management framework which will be discussed in Chapter Three.

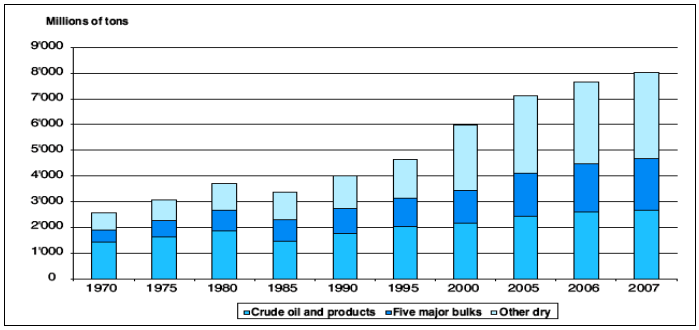
2.5 Seaport evolution

The previous section has reviewed the evolution of quality management. This section examines seaport development and quality management implementation in each stage of seaport development. The studies of Beresford *et al.* (2004), Paixao and Marlow (2003), UNCTAD (1992; 1999) and Verhoeven (2007; 2009) find that, similar to quality management development, seaport development has evolved through a number of phases. Before reviewing seaport development, a brief review of the role of seaports in the national and international economy will be provided. According to the UNCTAD

(2008), more than 80 per cent of the world's merchandise trade in terms of volume is transported by sea. From 1970 to 2007, international trade grew approximately 4.8 per cent per annum. In 2007, the volume of international seaborne trade reached 8.2 billion tonnes (see Figure 2.3).

Seaports are the gateways through which international markets are accessed and cultural interchanges occur. Dooms and Verbeke (2007) state that seaports are important component of the distribution systems because they facilitate the trade flow through their integration with other entities in the same distribution systems. Seaports are a driver of, and have a significant impact on regional and national development (Kurt 2010; Lowenthal 2005). For some countries, for example in the United States, seaports are a critical asset of the national economy because 99 per cent of the country's cargo goes through its seaports (Kurt 2010).

Figure 2.3. International seaborne trade



Source: UNCTAD (2008)

Based on the criteria of (i) major activities, (ii) capability of using communication information and technology, (iii) relationship with the seaport community, UNCTAD (1992), Beresford *et al.* (2004) classify seaports into three generations of their evolution. Paixao and Marlow (2003) propose the fourth-generation for seaports (see Figure 2.4).

Figure 2.4. Seaport evolution

Source: Adapted from Beresford *et al.* (2004), Guldenktas *et al.* (2006), Paixao and Marlow (2003), UNCTAD (1992) and Verhoeven (2007)

It is worth noting that, although the literature mentions the time milestone for each seaport generation (for instance, the first generation is between 1950s-1960s), in fact seaports around the world are currently being developed in the different generation. Some seaports are in the third or fourth generation (for example, Rottedarm and Singapore seaport) the others are still in the first or second generation (small local port, jetty) depending on how advanced their development is.

2.5.1 First generation

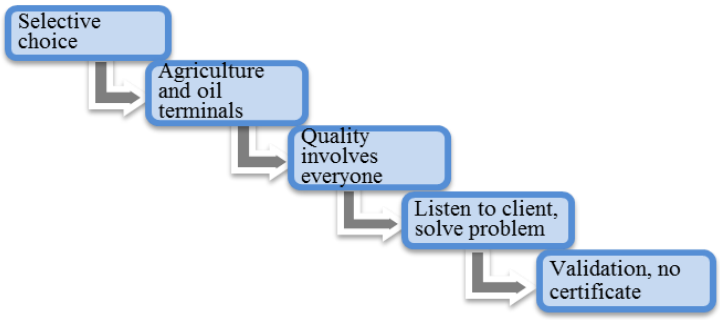
The first generation refers to seaports before 1960 (UNCTAD 1992). In this generation, seaports were the only interchange point between sea and land. The functions of a seaport were limited to the basic activities of loading, discharging, handling, storage and services around navigation, quay and waterfront area. The main cargos handled in the first generation were break bulk (UNCTAD 1992; 1998). Seaports were simple individual service providers, isolated from the surrounding community. Activities were confined within the seaport itself. There was no interactivity such as cooperation, commerce and promotion between the seaports and their users. All the relationships with customers were informal (Beresford *et al.* 2004; UNCTAD 1992). In the literature no quality management practice was mentioned in this generation.

2.5.2 Second generation

The second generation refers to seaports from the 1970s to 1980s when seaports started expanding their activities. The main cargoes were not only break bulk but dry and liquid bulk. The scope of seaport activities in the second generation expanded from basic cargo related activities and navigation to cargo transformation, ship industrial and commercial service (Beresford *et al.* 2004). According to UNCTAD (1992) in this generation, seaports offered larger areas for cargo flows and transformation and some value-added services such as a ship chandler and ship repairs. Seaports began acknowledging the importance of customers and the relationships with their transport partners and municipalities. Seaports started operating with other partners in the transport industry. However, these relationships were passive and casual. Interactions within the seaport itself were still loose (UNCTAD 1992).

In the second generation, quality management was primarily a commercial action focussing on listening to the customers and building relationships with seaport business associations. Quality management was applied to a selected activity only (Hoyle1983). Although UNCTAD (1998) recommends seaports use ISO 9000, it was not easy for a seaport to get quality accreditation. Thus, some seaports used a dual quality approach, which was either selective or progressive (UNCTAD 1998). This means that seaports implemented quality management in one terminal or a berthing area but not in all seaport activities (Hoyle1983). Taking a French seaport namely Nantes as an example. The seaport authority implemented quality management in its agricultural and oil terminals due to the benefits gaining from improving quality. This is a selective approach that applies to only important areas of Nantes seaport. The approach and procedure is shown in Figure 2.5

Figure 2.5. Quality management in Nantes seaport



Source: UNCTAD (1998)

In its quality management implementation, preventative maintenance, check-up procedures, guidelines and static checks were provided to staff to reduce losses of merchandise and improve the handling process (UNCTAD 1998). In business reality, this selective choice is still applied in a number of small and local seaports.

2.5.3 Third generation

The third generation emerged between 1980 and 1990 (UNCTAD 1992). Seaport activities expanded to incorporate logistics and customer services (UNCTAD 1992 and Woo *et al.* 2009). Under the pressure of business competition, increasing demand from seaport users and the bargaining power of seaport service providers, seaports became a node in the distribution network (Beresford *et al.* 2004; World Bank 2007).

In the final report on WORKPORT (1989-1999) submitted to the European Commission, Beresford *et al.* (2004) define the decisive factors affecting the seaports from 1980s to 1990s as an expansion of seaport activities into logistics, distribution centres with high value-added services and globalisation of seaport communities. In the third generation, seaport activities diversified from traditional functions to cargo and information distribution, and land based logistics activities. Seaports used advanced technology to enhance their quality of service. Seaport services became more specialised, variable and integrated. Seaports of the third generation also offered a

multiservice package and higher value-added services to customers (Beresford *et al.* 2004). According to UNCTAD (2004), the value-added services were seaport production and pre-distribution processing. They included but were not limited to packaging, adding a special label, reverse logistics activities (the process of managing the movement and storage of returned damaged cargoes, out-dated products) and information and technology supports (tracking and tracing shipments, online documentation and payment services) (UNCTAD 2004). In the first and the second generations, seaports rarely maintained a relationship with the users or the community; in the third generation, seaports were more integrated with the stakeholders and the municipality.

In relation to quality management, Beresford *et al.* (2004) and UNCTAD (1992) recommend quality assurance ISO for seaports in the third generation. Current homepages of seaports worldwide indicate that these seaports are implementing ISO quality management. For example, the Fremantle seaport in Western Australia implements the environmental ISO 14001, ISO 9001 quality and AS 4801 for safety certified by SAI Global (Fremantle seaport 2008). The seaport of Brisbane implements the environmental ISO 14001 (Port of Brisbane 2008). The seaport of Everglades in the United States, one of the national leading container seaport and a trade gateway to Latin America and the Caribbean has earned the ISO 9001:2008 certifications for its international terminal. The Virginia seaport implements ISO 9001:2008 and 14001 (Rodney 2010). Seaports in Malaysia implement ISO 9001 – 2003 and the Singapore seaport obtains the quality management certificate for bunker supply chain. The Port of Houston uses ISO 2007. It can be seen that safety and the environment are the major focuses of quality management in these seaports.

Many seaports are applying for the ISO series and the latest in place is the ISO 9001:2008, which provides a set of standardised requirements for quality management system (ISO 2009). The standard sets out what requirements an organisation's quality system must meet but it does not dictate how they should be met. This reiterates the 'engineering approach' of the ISO systems that the organisation concerned should develop its own formal documented processes and follows these processes. The processes should be formally recorded and be ready for audit and accreditation by an independent quality system certification body (ISO 2009) such as Bureau Veritas, American Society for Quality, ABS Quality Evaluation and Det Norske Veritas (VINAMARINE 2008).

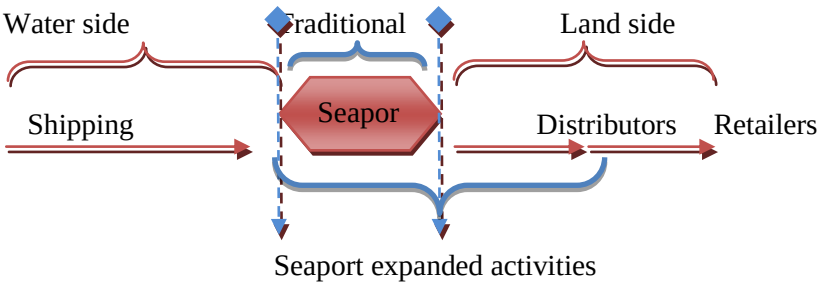
As the ISO series is largely dependent upon documentation, it does not inspire a quality culture within an organisation. This has several drawbacks in practice in real business. For example, if the declared processes are long and complicated, the concerned organisation may take shortcuts but still reported in records to meet ISO quality assurance requirements. The organisation may adopt this approach to gain a certificate to facilitate its marketing activities rather than building quality into its work culture (Nguyen 2009). Consequently, it makes the implementation of good working practices less meaningful. Adopting the ISO quality assurance series does not automatically enable organisations including seaports to apply fundamental quality management to achieve good organisational outcomes.

2.5.4 Fourth generation

Paixao and Marlow (2003) propose the fourth generation of seaport with a new perspective of 'leanness' and 'agility'. The fourth generation opens a window for some other studies on seaport development such as the studies by Beresford *et al.* (2004),

Panayides and Song (2008) and Roso *et al.* (2009). Seaports in this generation have a more flexible role in the development of the function of distribution networks. The functions of seaports expand to logistics activities. Seaports are not only the integral nodes merging waterborne ships, vessels and landside modes such as road and rail, but are also logistical platforms, where a supply chain can produce value added services to end customers (Paixao and Marlow 2003). This means that seaports are not only the places in which raw material, products are loaded or discharged but are also the warehouses for adding values- services (World Bank 2007). By providing value added services, seaports reduce lead-time, inventory and other related costs for customers. Consequently, this leads to minimising the total costs of production (see Figure 2.6)

Figure 2.6. Seaport expanded activities



Source: Adaped from Beresford *et al.* (2004), Paixao and Marlow (2003) and World Bank (2007).

In terms of quality management, Paixao and Marlow (2003) propose two levels of implementation. In the first level, a seaport should redesign its business process, which can bring radical changes. Child *et al.* (1991) state that the use of business process redesign in other industries resulted in an 80 per cent reduction of cost, about 50 per cent reduction of cycle time, and a 50 per cent increase in quality. Paixao and Marlow (2003) suggest that the application of this redesign approach requires a top-down commitment, cross-functional approach, long-term strategy and information technology. In the second level, a seaport needs to consider implementing total quality

management (Paixao and Marlow 2003). This appears to be the first time that total quality management was suggested for seaports.

In the literature, studies using total quality management approach for seaports were conducted by Chlomoudis *et al.* (2005) and Chlomoudis and Lampridis (2006). In the first study, Chlomoudis *et al.* (2005) advocate the use of total quality management practices to initiate the concept of total quality seaport. These researchers reviewed the criteria of the European Quality Award (EQA) and Malcolm Baldrige National Quality Award (MBNQA) in relation to seaports. From this context-based review and qualitative analysis, the researchers conclude that quality awards could be applied for

Table 2.2. Quality seaport based on European Quality Award

Leadership	Long-term commitment and resources deployment for quality. Establish a vision and a mission and instil values for excellence. Seaport-wide leadership culture. Align seaport staff in achieving specific goals, empowerment and motivation. Change management and improvement techniques.
Policy strategy	Define seaport stakeholders and their expectations. Information development. Develop a strategic business plan. Develop staff commitment to the seaport mission and goals. Develop management and support processes.
People	Develop human resources management plan. Appraise process, staff development, training and staff empowerment. Develop staff satisfaction feedback-management process
Partnership and resource	Define a twofold strategy and culture: within organisation and outside organisation. Define a seaport partnership, creating added values for seaport customers. Define and manage seaport internal resources: seaport finance, buildings, technology and equipment, technology, information and knowledge.
Process	Develop a seaport-wide process. Determine and build key and support seaport processes. Interrelation of seaport processes.
Customer result	Customers are recipients of products and/or service. Measuring external customer satisfaction. Customer satisfaction, customer loyalty and customer value are key indicators of seaport operation.
People results	Port staff are important seaport stakeholders. Staff perception is measured. Develop specific strategy to communicate seaport and people results to all seaport staff.
Society results	Define seaport citizenship strategy and its position in 'society', seaport policies: safety of individuals, longevity, resources preservation, harmony with local community, contribution to public interest and communication strategy for society results.
Key performance	Define the key performance results of seaport strategy, quality, plans and customer experience. Break down the key performance results to key outcomes to key performance measures.

Source: Chlomoudis and Lampridis (2006)

the seaport industry. This study, however, has not clearly outlined the dimensions of each practice seaports should apply. By using qualitative analysis, Chlomoudis and Lampridis (2006) attempt to overcome the shortcoming of the study of Chlomoudis *et al.* (2005).

Adopting a similar approach, Chlomoudis and Lampridis (2006) analyse the European Quality Award quality criteria to derive statements or actions for measuring items corresponding to each European Quality Award criterion (see Table 2.2). While Chlomoudis *et al.* (2005) and Chlomoudis and Lampridis (2006) contemplate the application of quality awards in seaports, the efficacy of their total quality seaport model is questionable.

Firstly, this model is constructed without having empirical validation, thus raising the question of validity of the model. Secondly, Chlomoudis and Lampridis (2006) attempt to overcome the shortcoming in the work of Chlomoudis *et al.* (2005) by indicating the measurement items for each corresponding European Quality Award quality criterion. However, there is no concrete evidence that the quantity and relevancy of these items are appropriate. Besides, there has been no indication of whether the European Quality Award or Malcolm Baldrige National Quality Award, or the combination of these two awards, is appropriate for seaports of the fourth generation. Moreover, total quality management proposed for seaports in this generation does not cover efficiency in cargo flows, waste elimination and process optimisation, which are the major characteristics of ‘lean’ and ‘agile’ seaports. This model focuses more on the internal operation of a seaport rather than its external relationship with other network partners. Thus, this proposed quality management model may be insufficient for seaports with expanded logistics activities.

Seaports around the world have experienced tremendous growth in recent years, stimulated by a number of factors such as globalisation of trade, growth in maritime transport, logistics development and specialisation in production (Cuadrado *et al.* 2004). At the same time, seaports are involved in increasingly intense competition, both intra-port and inter-ports, while land transport modes are also developing rapidly. Seaports evolve to change their roles to adapt to new business environment, provide more services and become an element of a more complex system than logistics that is a supply chain. Hence, quality management for seaports will also change.

2.5.5 Fifth generation - seaports in supply chains

Increasingly in the literature, there is a trend to re-evaluate the roles of seaports in supply chains such as in the studies of Bichou and Gray (2004), Casadesus and Castrao (2005), Chin *et al.* (2006), Heaver (2006), Panayides (2006), Robinson (2002) and Robinson and Malhotra (2005). Heaver *et al.* (2000) firstly question a future role of seaports whether seaports in future would be fully integrated with partners, or remain as a supporter, or totally disappear. In response, Notteboom and Winkelmans (2001) argue that rapidly changing market environment will push seaports to expand their activities and relationships with their stakeholders cover a wider scope of services. Thus, seaport management is no longer limited within seaport itself but is also a concern of other supply chain stakeholders.

Secondly, the competition is not restricted between seaports, but supply chains (Simchi-Levi *et al.* 2008). Robinson (2002) observes a number of supply chains focus on seaports and found that seaports compete based on the supply chains they are embedded. Robinson (2002) also concludes that shippers rather choose supply chains with a competitive advantage than an individual seaport. This conclusion is supported

by Magala and Sammons (2008) on a study of a seaport choice modelling. These authors refer to the real life example of the construction steel import into Australian seaports in New South Wales. In this example, seaport management or ocean carriers would never understand the shippers' choice of a seaport until reviewing supply chains they are involved. Rodrigue and Notteboom (2008) argue that seaports and inland terminals extend their role as distribution centres to become more active in the supply chains. This means that seaports are increasingly integrating into the supply chains.

Thirdly, seaports are a node of inbound and outbound logistics (Mangan and Lalwani 2008). Being port-centric logistics (Mangan and Lalwani 2008) seaports add more values to shipments that even make them more integrated into the value chains. Moreover, being a transport node the role of seaports is essential in managing effective and efficient supply chain flows.

Fourthly, the position of seaports in the supply chains is indirectly addressed in the literature which examined the importance of stakeholder management in seaports and the environmental strategy adopted by the seaports, such as the study of Dooms and Verbeke (2007) and Haezendonck and Dooms (2007). These authors suggest that stakeholder management can be usually adopted in the long term and daily activities. The researchers argued that green management in seaports is critical and seaports can no longer be considered in isolation, but in the supply chain context. This argument is also favoured in the study by Haezendonck and Dooms (2007) who argue that seaports should focus on sustainable strategic decisions and actions, including promoting environmentally friendly transport methods for hinterland traffic. These arguments support the notion that safety, security and environmental management should be an integrated part of a seaport's management policies, and should be designed and implemented in conjunction with other partners.

In management practice, many seaports are increasingly perceived as integrated and inseparable nodes in the supply chains. For example, the Victorian Transport Distribution and Logistics Industry Roundtable (Victorian Transport Association 2009) in Australia offers interactive flow-charts of import and export processes in their homepage to help members understand the processes, organisations and documents involved, as well as to enhance their awareness of the role of the Port of Melbourne as one of the integrated partners in the supply chain. In the case of the Port of Rotterdam, multiple logistics service providers and the logistics departments of companies cluster in the seaport's distriparks (distribution parks), namely, the Eemhaven, the Maasvlakte, and the Botlek distriparks. These distriparks are advanced and have a strategic location to be able to respond to logistics demands like 'just in time' delivery at low costs (World Bank 2007).

2.6 Summary

This Chapter has reviewed the evolution of quality management and of seaports. Interestingly, the literature review shows that both quality management and seaports have gone through five milestone stages in the similar time periods. The quality management evolution started from quality inspection (1950s-1960s), then developed through quality control (1960-1970), quality assurance (1980-1990), total quality management/excellence models (1990-2000) to the current stage, which is lean six-sigma (2000-2010). Similarly, seaports have evolved from the first generation (1960-1970) through the second generation (1970-1990), the third generation (1990-2000) to the fourth generation (2000-2010). Seaports are a node of supply chains that indicates they may be in the fifth generation of their evolution.

In relation to how seaports have implemented quality management through their evolution, it is found that no clear quality management undertaken by first generation seaports. In the second generation, seaports attempted to apply quality control and quality assurance in some of their areas or activities. Seaports of the third generation widely implemented ISO quality assurance, while total quality management is proposed for seaports in their fourth generation. However, the proposed quality management approach for the fourth-generation seaport does not reflect and cover the meaning of lean and agility. Being a node in global supply chains requires seaports to interact more with other organisations (or stakeholders). The current quality management approach, which is internally focused, may not be suitable for seaports in the new business context. Thus, seaports may need to seek a new quality management approach to assure the quality of their service and at the same time to collaborate and work effectively with other stakeholders. This will be discussed in the next chapter.

CHAPTER THREE

SEAPORTS IN SUPPLY CHAINS AND QUALITY MANAGEMENT

3.1 Introduction

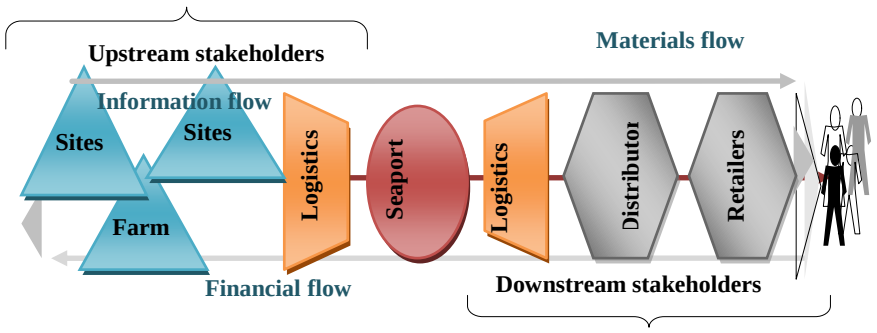
Seaports currently are in the fifth generation of their evolution, in which seaports become a node integrated in supply chains as discussed in Chapter Two. The purpose of this chapter is to propose the quality management practices for seaports, it begins by reviewing a supply chain, its relationships and the seaport influences within supply chains. Supply chains are the multinational and multifunctional organisations that require high integration from their stakeholders (Balou 2010; Coyle *et al.* 2008; Gattorna 2006). Thus this chapter examines the factors that enable seaports successfully integrated in supply chains. This Chapter also reviews quality management in maritime logistics and supply chain. Based on the outcomes of these discussions and of the selected quality management practices from generic use (see Section 2.3 of Chapter Two), the quality management practices are proposed.

3.2 Supply chains

The concept of supply chains first was introduced by Keith Oliver when he conducted the interviews for the Financial Times in 1982 (Blanchard 2010; Feller *et al.* 2006). According to Keith Oliver, the idea behind supply chains is that organisations integrate themselves in a large network to manage market and production fluctuations by exchanging information. This concept then is explained by Bowersox (1999) and Lambert (2008) as an extended enterprise; global production network (Balou 2010; Burgess *et al.* 2006) and next generation manufacturing system (Chen and Paulraj 2004; Robinson 2002). It is actually a system of organisations, people, technology, activities, information and resources involved in transforming natural resources and raw materials into finished products then deliver to the end customers (Christopher

2005; Kim 2006; Simchi-Levi *et al.* 2004). A basic typical supply chain structure can be illustrated in the Figure 3.1.

Figure 3.1. A basic supply chain



Source: Adapted from Balou (2010), Christopher (2005), Simchi-Levi *et al.* (2004).

A supply chain involves a number of different organisations and processes with clear and mutual objectives (Coyle *et al.* 2003, 2008; Mentzer *et al.* 2001; Wang *et al.* 2007). These objectives are: providing better customer services, reducing total costs (Farris and Hutchis 2002), increasing asset productivity (Boyson *et al.* 1999), on-time delivery (Baker 2008; Gaudenzi and Borghese 2006), enhancing financial and operational performances (Pohlen and Coleman 2005; Wang *et al.* 2007). Kok *et al.* (2005) add synchronizing the supply chain and changing the business from push to pull (Wang *et al.* 2008) to supply chain objectives. Balou (2010) summarises that a supply chain is a system of activity integration to fulfil customer demands and to achieve a sustainable competitive advantage through the most efficient use of resources.

3.2.1 Supply chain relationships

Involving different organisations in a united network, the relationship in supply chains is important and it makes supply chains different to other single organisations. Kenneth *et al.* (2007) suggest supply chain relationships need to be seen from the operational and management aspect. From the operational aspect they include the strategic, tactical

and transactional activities that make supply chains flows efficient and effective. From the management aspect they are actually intra- and extra-organisational activities. Unlike the single organisations, the supply chain objectives and relationships require their organisations to look beyond organisational boundaries to utilise all the resources and capabilities for creating more added values.

Gattorna (2006) explains that these relationships are transactional as each stakeholder takes outputs from its upstream stakeholder for its input then transfers to the next downstream stakeholder, for example, the output of manufacturing is the input of transport provider. This is in line with the study of Coyle *et al.* (2008), who support that supply chain relationships are between the upstream (material suppliers, manufacturing plants, products processing centres, work-in-process inventory, manufactures) and downstream stakeholders (retail outlets, finished products distributors and end users). The stakeholders are connected by transportation and storage activities. These transactional relationships require stakeholders closely working together thus a final product can be delivered to the end users efficiently (Gattorna 2006).

The relationships of stakeholders in a supply chain are mutually beneficial. The stakeholders provide their service for the same product but in the different processes and in the different activities. In this case, the cost, quality and delivery time of their services become essential. If the stakeholders well collaborate and coordinate, the movements of the production will be smooth, the wastes the transactional gaps will be reduced and the benefits of each stakeholder will be increased. This is particularly important for the large and complex global supply chains involved multi-nations and multi-cultures.

Discussing relationships in supply chains, Kok *et al.* (2005) suggest they should be managed in a way that can utilise capabilities of each organisation to achieve

significant benefits. Maintaining good relationships enables organisations not only to work effectively with stakeholders but also to improve their business. This can be achieved by sharing responsibilities and risks (Anderson *et al.* 2000; Li *et al.* 2006), pooling resources to reduce transaction costs (Spekman *et al.* 2002), concentrating on the core competency and being flexible to rapidly respond to market changes (Frohlich and Westbrook 2001). Furthermore, maintaining collaborative relationships, organisations are able to evaluate inventories, systems, processes to explore more opportunities (Li *et al.* 2006).

The relationships determine the type of a supply chain. Some supply chains are simple, whilst the others are complex depending on the size of the business (Fawcett and Magnan 2002), the level of product sophistication (Jespersen and Skjøtt-Larsen 2005; Frohlich and Westbrook 2001), numbers of organisations included and productions involved (Rosenzweig *et al.* 2003). The relationship in supply chains can be dependent or dominant. Jespersen and Skjøtt-Larsen (2005) comment that power or dominance is an important factor, which indicates the level and suitability of supply chain integration. In supply chains a stakeholder who is highly dependent on the others will be powered and forced by the less dependent stakeholders. Given that power, the less dependent stakeholders will have advantages and manage the relationships of the supply chain (Frohlich and Westbrook 2001). Greenwood (2007, p. 319) argues that 'an organisation may glean contributions or manage risk posed by influential stakeholders'. The similar findings on the power and influence of the stakeholders can be found in the study of Green and Hunton-Clark (2003).

Balou (2010), Frankel *et al.* (2008), Kanda and Deshmukh (2008) state that managing supply chain relationships means managing the material, financial and information

flows. Therefore, the Council of Supply Chain Management Professionals (as sited in Simchi-Levi *et al.* 2004) concludes:

> *Supply chain management encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and logistics management It includes the crucial components of coordination and collaboration with channel partners, suppliers, intermediaries, third-party service providers, and customers*
>
> Simchi-Levi *et al.* (2004, p.34)

Dotson *et al.* (2003) Romano and Vinelli (2001) and Varma *et al.* (2006) indicate that supply chain management originates from logistics and integrated logistics management. It then expands to 'a seamless supply chain' (Towill *et al.* 2002, p. 89) and finally global supply chain management. The increasingly globalisation and outsourcing progress makes supply chain management became important. Similarly to the traditional supply chain management, the main objectives of global supply chain management are reducing the costs of procurement and reducing risks. However, global supply chain management involves worldwide organisations rather than national (SCM Global 2005).

Global supply chain management provides an integrated and seamless solution at every point along the supply chain, from country to country (Cooper *et al.* 1997; Mills *et al.* 2004; Johnson and Wood 1996). Seaports are a part and influent to supply chain management. The following section examines the role of seaports in supply chains.

3.2.2 Seaports in supply chains

The literature indicates that depending on the complexity of a supply chain, seaports can be (i) an integral node, which links different modes of transportation together (Notteboom and Winkelmans 2001), or (ii) a platform, which provides the value added

services for the upstream manufacturing stakeholders and downstream service stakeholders (Robinson 2002) and significantly influences on the efficiency of the whole supply chain (Carbon and Gouvernal 2007).

As an economic and cultural interchange point, seaports play a central role in facilitating flows through their integration with other stakeholders (Mentzer *et al.* 2001). As a management centre for the movement of freight from origin to destination, the role of seaports is not limited to controlling their operations and activities, but facilitating the efficiency of freight movements of supply chain network (Coyle 2003; 2008; Mentzer *et al.* 2001; Wang *et al.* 2007). A seaport can also be a bottleneck, where congestion frequently occurs. Hesse and Rodrigue (2004) argue that seaport hinterlands have become a key component to link more efficiently elements of the supply chains because it enhances just in time delivery, availability of products and total cost reduction processes.

The current development of intermodal transportation and global supply chains makes seaports became a critical node to connect transportation modes such as rail, roads, or pipeline toghether. However, due to the complexity of supply chains seaports can cause risks and disruptionsoccuring during operation and management processes (Gurning and Cahoon 2010). The seaport related risks can be internal and external. The internal are those inherent within the operations and management systems of seaports. This risk comes from the vulnerability of physical infrastructures and facilities of the seaport, and the shortfalls in the seaport's operations and management systems (Vanags 2002). Seaport equipments breakdown contribute to the supply chain disruption. Any discontinuation of seaport handling equipment would impede the flows of cargo operations within the seaports (Thai and Tran 2011). The vulnerability of control systems used in modern seaports such as vessel traffic management system, terminal

management system and other information and communication technology systems could also potentially lead to the supply chain disruption such as collisions and sinking of vessels (Wilson 2007). The seaport information centre also connects the seaport and all other seaport users such as shipping lines, freight forwarders, truckers, cargo-owners such as Seaportnet in Singapore and Adema in Le Havre port (Thai and Tran 2011). This will make more potential disruptions if the systems are not managed in a proper way.

Moreover, the supply chain disruptions can come from the complexity of interface between the seaport and other supply chain players such as transport operators, cargo-owners, freight forwarders, and logistics service providers. They are external, interactive risks. Although there may be a smooth flow of cargo operations within the seaport area, bottleneck at the interface between the seaport's gates and hinterland transport could occur due to disruptive events in the hinterland of the seaport such as congestion in the hinterland connection modes. Once this happens, not only normal seaport operational activities but also international trade would be affected (Thai and Tran 2011).

Having significant influences on the efficiency and effectiveness of supply chains requires seaports to integrate effectively in supply chains. Frohlich and Westbrook (2001), Narashihan and Jayaram (2001), Johnson (1999) and Stank *et al.* (1999) assert that companies with the wide degree of integration with suppliers and customers have a better customer service and organisational performances. The following section examines the factors that seaports should consider when further integrating in supply chains.

3.2.3 Seaport integration

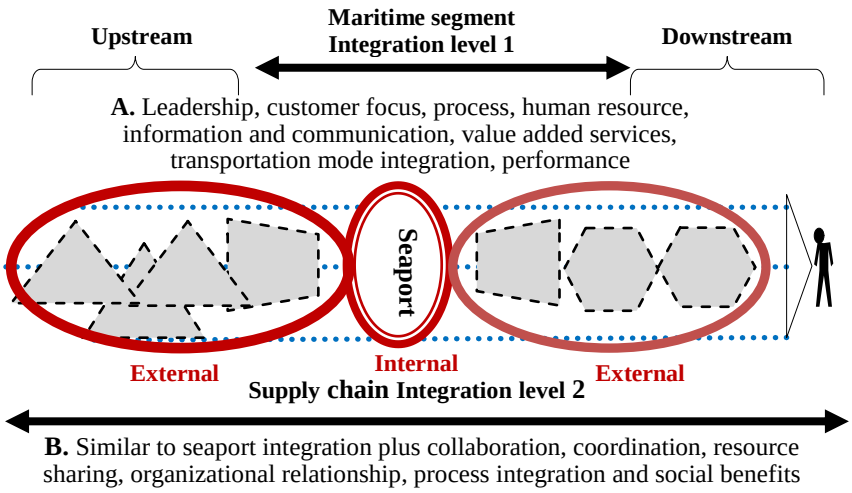
The discussion on seaport integration can be found in the works of Anttila (2010), Bichou and Gray (2004), Carbone and De Martino (2003), Lewarn (2006), Paixao and Marlow (2003), Panayides (2006, 2007), Panayides and Song (2007), Robinson (2002) and Sayareh (2009). Robinson (2002) suggests that integrated seaports need to provide value added services from procurement, packaging, labelling, and cross-docking activities to launching new services to satisfy specific needs of customers. Offering more value added activities reducing total costs of a product and attracting more customers will help seaports fully integrate into networksupply chains. This is supported by Paixao and Marlow (2003), who argue that the integration should be done in 'their operations vertically both upstream and downstream in the logistics chains', and sharing information and technology will improve coordination and reduces time for stakeholders (Paixao and Marlow 2003, p. 74).

Panayides (2006) proposes a framework of the seaport integration, in which good communication and technology, relational capability including inter-organisational relationship, trust, commitment and adaptation, facilitation of inter modal integration, provision of value added service and planning for efficient and effective operation of a whole chain are the key factors. Panayides (2007) then validates his model by mail surveying 440 seaport respondents. The outcomes show that using technology for sharing data with shipping lines to maintain long-term relationships are most important as they enhance profitability. In the discussion on developing efficient supply chains through effective seaport organisation, Sayareh and Lewarn (2006) suggest that in supply chains, seaports should produce high quality services by having proper planning and capable leadership. Sayareh and Lewarn (2006) also found 13 criteria that help seaports effectively work in the supply chain environment. They are leadership, human

resource, planning, growth, efficiency, information and communication, customer satisfaction, professionalism, value added, integration with different transport modes, transport provider relationship channel integration, collaboration, cost-effective management and supply chain performance.

Kahn and Mentzer (1996) suggest from the organisational aspect, that seaports should be internally and externally integrated. The internal integration is within individual traditional functional systems to manage the organisational activities (Vickery *et al.* 2003). External integration is across boundaries and across organisations (Francis 2008). Frankel *et al.* (2008) and Vickery *et al.* (2003) state that the key capabilities in external integration are customer service, quality, channel distribution, total cost minimisation and data information. It can be seen that when operating in supply chains, seaports may need to manage relationships between departments (internal integration) and relationship with other stakeholders (external integration) in supply chains.

Figure 3.2. Seaport integration in supply chains



Source: Author

By grouping the above mentioned factors, seaports need to consider leadership, customer focus, process, human resource, information and communication, value added

services, transportation mode integration and performance measurements for their integration within maritime logistics as the first level (see Figure 3.2).

The discussion on the integration above is limited within a seaport itself. It is necessary to examine the integration from the supply chain side. Fawcett and Magnan (2002) state that supply chain integration requires intensive joint activities. It reflects sustainability, adaptability and flexibility to the environment changes (Denison and Spreitzer 1991). Fawcett and Magnan (2002) provide four types of integration. They include (i) cross-functional process integration, (ii) backward integration with key first-tier suppliers, (iii) forward integration with key tier customers and (iv) upstream and downstream integration. The study of Simatupang and Sridharan (2002) and Rodrigues *et al.* (2004) suggest three levels of integration, which are (i) organisation integration with suppliers (ii) internal integration across the supply chain (iii) integration with the customers.

The effectiveness and efficiency of supply chain management is determined by the degree of integration (Chin *et al.* 2004). Lee (2000) points out three major factors: information and resource sharing, coordination, and organizational relationship. Simatupang *et al.* (2002) add logistics synchronization, incentive alignment, and collective learning and collaboration, among them collaboration is the highest factors. Vanichchinchai and Igel (2009) highlight that most supply chain management frameworks disregard the fact that the implementation must go from internal organisation with emphasising human resource and applying total quality management then move on to the external business partners.

Anttila (2010) shares opinion that quality integration should cover major areas: (i) financial and business management to increase key competences such as leadership, operational expertise, dismiss uncertainties in business activities, gaining respect of

professionalism within stakeholders; (ii) human resource management, (iii) information occupational health, security, safety and environmental management

In summary, for supply chain integration, factors such as leadership, business strategy, information sharing, collective learning and collaboration, coordination and resource sharing, organizational relationship, process integration, social benefits are the common requirements for any stakeholder to work harmonically in a network chain are mentioned in the literature.

To propose a quality management practices for seaports integrated in the supply chains, this study argues that these practices should be compatible with those applied in supply chains. The section below examines the supply chain quality management requirements that seaports need to consider when integrating in supply chains.

3.3 Supply chain quality management

As discussed in the above section, the integration of seaports is suggested to be implemented at two levels: maritime logistics and supply chains. Quality management therefore should be implemented accordingly. To propose a framework, it is necessary to review quality management in maritime logistics and supply chains to select the quality management practices that are essential for seaports in supply chains.

3.3.1 Quality management in maritime logistics

In supply chains, maritime logistics consist of shipping and other different transportation modes that are involved in transporting a product from its place of origin to the destination (Lambert *et al.* 1998; Panayides and Polyviou 2011). In the context of the shipping industry, Frankel (1993) argues that quality management in shipping requires effective planning, process management, customer focus, operational management and control. From Frankel's view point, these practices can only be

achieved by total organisational participation led by the top management. He also argues that in the context of integrated intermodal transport, for instance, shippers, freight forwarders, non-vessel owner common carrier and seaport operators. It is critically important for shipping operators to satisfy the service quality needs of their shippers and other stakeholders.

The concept of quality shipping in business reality is related to safety and environmental protection (Bengtson 2000; Hawkins 2001; Eliades 2002; Ruiter 1999). This is because accidents and day-to-day operations in shipping could have some disastrous consequences (Ng and Song 2010), and when an accident occurs, not only the company's shareholders but also others such as the fishery and tourism industries suffer the loss of property. Quality management in service organisations places a strong emphasis on human performance and this is also true in shipping companies as the quality of human performance in these organisations has a strong association with safety and environmental management performance. Literature in this respect argues that quality shipping means much broader than just providing quality services. Botterill (1995) expresses the important contribution of quality management in shipping where safety management is 85 per cent of the ship management system. Similarly, the International Safety Management (ISM) Code has considered the quality management standards for the shipping industry. Several studies have been conducted to examine quality practices for the successful implementation of this Code. These studies found that focusing on human principle (such as management commitment, employee involvement and empowerment, continuous training), effective intra- and inter-organisation communication, and developing a safety culture are critical quality and safety management issues in maritime transport (Jenner 2000; Sudhaka 2007; Thai and Grewal 2005). Seafares' training and commitment of top managers to this Code will

increase and ensure safety (Le Muer 2003; MacLean 2005; Hernqvist 2001). The implementation of a safety management system will be successful if employee involvement at all levels is commited (ISM 2007).

Another direction in the examination of quality management practices in the shipping industry is to investigate the approach taken for the management of maritime security. Given its increasing importance, maritime security is a specific element in the safety and environmental management. Several researchers have proposed and justified the application of the quality management approach so as to realise security outcomes. Lee and Whang (2003) and Lee and Wolfe (2003), for example, are prominent researchers in this context, emphasise the critical practices in security management. They are prevention from sources, process management and commitment and and involvement of senior management, empowerment and training employees. This is because, similar to issues of maritime safety, when maritime security incidents occur, they will have tremendous impacts on the normal operations of not only shipping companies and seaports but also other chain partners such as shippers, thus affecting the trade flows (Thai *et al.* 2008). Effective security management is therefore part of the quality management framework of these organisations since it affects the reliability of their service performance which is in turn considered part of the quality service of seaports.

A recent study by Bichou *et al.* (2007) also suggests a quality management framework for liner shipping companies. The framework suggests a 24-hour advance vessel manifest rule that encompasses well-established quality management practices in the literature such as management commitment, improvement team, performance standards, awareness, training, root cause removal, and continuous improvement. Again, the importance of quality management practices such as management commitment and continuous improvement are emphasised as fundamental quality

management practices in shipping. In this respect, it is evident that maritime security management should be part of the company's quality management framework, while quality management practices should also be used for the effective management of maritime security. This is equally true in both shipping and seaport organisations since effective security management will enhance service reliability for both.

Cheng and Choy (2006) synthesise various earlier studies in the literature. They developed eight practices of quality management, namely, leadership, customer focus, process management, training, employee relationship, quality data and reporting, stakeholder quality management, continuous improvement, and tested them in a survey involving ship-owner members of BIMCO (Baltic and International Maritime Council) and INTERTANKO (International Association of Independent Tanker Owers). Their study reveals the most important successful practices of quality management in the shipping industry are top management participation, customer focus, employee training and empowerment, quality information and performance measurement. This again shows that these practices are used in not only generic quality management but also in supply chain quality management as discussed above.

In relation to studies on the activities of other modes of transportation such as rails, roads, air transport, storage and distribution activities Read and Miller (1991) have found that a lack of pressure to initiate programs and of managerial support are the major obstacles to the implementation of quality management in the logistics industry. Sohal *et al.* (1999) draw a similar conclusion from a study on Australian logistics organisations. Millen and Maggard (1997) add that the major obstacle of the implementation is a lack of highly skilled and professionally trained human resources. The findings of these studies indicate that quality management in maritime logistics has a strong emphasis on leadership and human resource management.

Table 3.1. Quality management practices in maritime logistics

Authors	Practices
Lee and Whang (2003); Lee and Wolfe (2003), Thai and Grewal (2005)	Security management, prevention from source, process management and total organisational focus in terms of the commitment and leadership of senior management, and the involvement, empowerment and training of employees
Bichou et al. (2007)	Management commitment, improvement team, performance standards, awareness, training, root cause removal, and continuous improvement, security management
Cheng and Choy (2006)	Leadership, training, employee relations, process management, quality data and reporting, stakeholder quality management, continuous improvement, and customer focus, human performance, in that fundamental practices such as top management commitment and leadership, employee involvement and empowerment, customer focus, and process management
Lai *et al.* (2004)	Quality improvement team, quality measurement, and continuous improvement
Bengtson (2000), Hawkins (2001), Jenner (2000), Sudhaka (2007)	Safety management and environmental protection issues

Lai *et al.* (2004) survey quality implementation in the logistics industry in Hong Kong. The researchers propose a ten step approach to implement quality management, which is similar to the previous studies. However, in their study, a quality improvement team, quality measurement, and continuous improvement are added. Rahman (2006) compares the practices between manufacturing and logistics organisations in Australia and finds that on time delivery is the most important practice. Rahman (2006) also finds that logistics organisations use several forms of organisational structures, in particular a steering committee of senior staff, to support quality programs. It can be seen that quality management practices in logistics are not different to those in shipping (except that quality management in logistics uses on time delivery as one of the major practices) and in other service organisations (section 2.4).

In summary, quality management in maritime logistics employs the major quality management practices that are found in ISO and total quality management. However, quality management in maritime logistics also emphasises safety, security,

environmental management and on time delivery which differentiates the maritime logistics industry from other industries (see Table 3.1). As seaports are a part of maritime logistics, they may need to include these quality management practices in their quality management program.

3.3.2 Quality management in supply chains

If the maritime segment is suggested to be the first level of seaport integration, the supply chain is the second level. This second level works as a master pool, which includes the quality management practices that each stakeholder should have in order to work harmoniously and effectively. In theexisting literature, quality management in supply chains has been investigated by, for example, Carbon and Martino (2003), Flynes *et al.* (2005), Flynn and Flynn (2005), Kuei *et al.* (2008), Kuei and Madu (2001), Lambert and Cooper (2000), Lin *et al.* (2007), Saraph *et al.* (1989), Sayareh (2009) and Sila *et al.* (2006).

Lambert and Cooper (2000) identify the factors affecting supply chain quality management, which include planning, control, work structure, organisational structure, product flow facility, information flow facility, management methods, power and leadership structure, risk and reward structures, cultural factors and attitude. However, the framework of Lambert and Cooper (2000) does not conclude how these factors should be arranged to achieve a more effective and efficient supply chain structure, nor does it examine the supply chain from an integrated perspective.

The study of Carbon and Martino (2003) identifies eight practices, which are related mostly to customer focus and manufacturing flow management. They emphasise the great impact of information technology and communication on the structure of the supply chain as it speeds up the process, reduces product life circles and enhances long

term relationships. Information and technology helps supply chain customers understand the quality of price and products offered to them. Similar findings are reported by Kuei and Madu (2001), who confirm the importance of information technology. However, the study of Kuei and Madu (2001) introduces three new quality practices, which are benchmarking, supplier selection and supplier participation. According to Kuei and Madu (2001), supplier participation and supplier relationship can have an impact on organisational performance.

Lai *et al.* (2005) suggest that supply chain quality management programs should include traditional quality management practices by concentrating on operational matters. Suppliers' participation including total quality management practices is suggested to be incorporated in supply chain quality management by these researchers. By incorporating suppliers as important members of the supply chains, organisational performances can be optimised. If possible, organisations should involve suppliers in designing and developing new products to ensure that the quality built in the products will meet customer requirements. This would lead to improved product quality and increased customer satisfaction. Lai *et al.* (2005) recommend that supply chain stakeholders need to understand supply chain relationships as a key driver of supply chain performance. This is also supported by Lin *et al.* (2005), who mention that traditional quality management practices and pertinent total quality management practices should be incorporated in supply chain quality management. In addition, the interactions between manufacturers and suppliers based on cooperation, trust and long-term relationships could enhance quality improvements among supply chain stakeholders.

Flynn and Flynn (2005) develop and test a framework in 164 machinery, electronics and transportation components plants in the USA, Germany, Italy, Japan and England.

They identify six components as the most critical factors of quality management in supply chains, which are customer and market focus, leadership, strategic planning, information analysis, human resources development and process management. They also find a positive relationship between quality management and supply chain management and provide managers a guideline on how to use this relationship as a powerful weapon in the global competitive environment. These researchers suggest suppliers to be proactive in the design and product development process as this improves quality conformance and customer satisfaction. According to them, about 80 per cent of the manufacturing costs of new products committed in the early stage and the remaining 20 per cent in the design stage. Involving suppliers in the early stage may help improve design quality which in turn helps improve customer satisfaction and reduce costs. Similar outcomes are found in the study of Sila *et al.* (2006) on supply chain quality management in manufacturing organisations in the United States of Ameria. Their findings reveal that leadership is essential for effective supply chain quality management, and human resources are directly related to process management. Of interesting that human resources and customer focus have no direct relation, that is contradict with other researchers who found that customers can be easily lost if they are not happy with the quality of products or services. Therefore, organisations should strive to achieve customers' loyalty.

The comprehensive study of Kuei *et al.* (2008) perhaps covers findings from previous studies and providing four major supply chain quality drivers: supply chain competencies, success factors, strategic practices and supply chain quality practices. Kuei *et al.* (2008) argue that a harmonised and efficient relationship among these four components needs to exist. In addition Kuei (2011) pointed out five main drivers

affecting the global supply chains. They are outsourcing, environment protection, waste elimination, community development, and adopting advanced technology.

Table 3.2. Quality management practices in supply chains

Authors	Practices
Lambert and Cooper (2000)	planning, control, work structure, organisation structure, product flow facility, information flow facility, management methods, power and leadership structure, risk and reward structure, cultural factor and attitude
Martino (2003)	customer relationship management, customer service management, customer fulfilment, product development and commercialisation, demand management, manufacturing flow management, return, procurement
Coyle (2003)	business policies, plans and information to its upstream and downstream supply chain stakeholders so as to get their coordination and collaboration,
Lin *et al.* (2005)	environmental uncertainty, customer focus, management support, supply strategy, information technology, supply network structure, managing buyer-supplier relationship and logistics integration
Flynn and Flynn (2005)	customer and market focus, leadership, information and analysis, human resources development and management, process management, and strategic planning
Sila *et al.* (2006)	leadership, strategic planning, customer focus, human resources management, process management, and supplier management
Kuei *et al.* (2008)	leadership, quality culture, customer focus strategic planning, supply network structure, managing buyer-supplier relationship, manufacturing flow management, just-in-time
Sayareh (2009)	Just-in-time (JIT), a quick response, lead-time management, lean logistics, agile logistics and integration of functions and management of organisations

Source: Author

Deriving from previous studies, Sayareh (2009) suggests that just-in-time (JIT), a quick response, lead-time management, lean logistics, agile logistics and integration of functions and management of organisations are the key factors that stakeholders should take into account when operating in the network. Table 3.2 summarises the studies on quality management in supply chains.

To summarise, the quality management practices most commonly recommended by researchers in supply chain quality are leadership, customer focus, process, information and technology, collaboration, coordination and human resources. In general, the

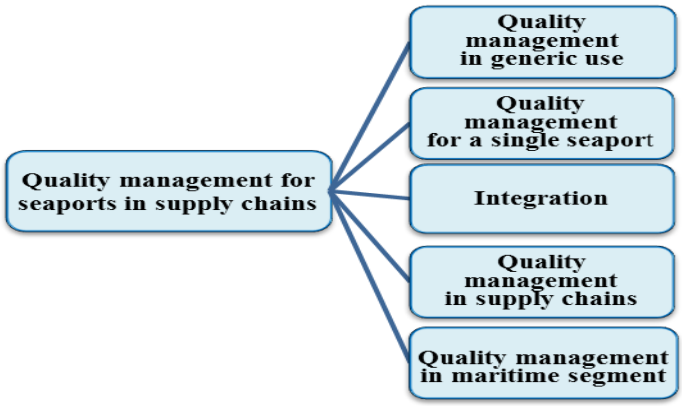
literature suggests that these practices will help stakeholders in supply chains manage major flows including material, finance and information smoothly, seamlessly, and with minimal costs and errors.

3.4 Proposed quality management practices

As a result of the changing role of seaports, this study argues that quality management must take a wider perspective and consider (i) how quality is managed across the supply chain, and (ii) the role of seaports in enabling this to occur. In this study, the proposed quality management practices for seaports in supply chains are derived from the outcomes of discussion on important quality management practices in the different stages of quality management evolution; quality management practices implemented in individual seaports, in the logistics maritime segment, in supply chains; and the factors contributing to the successful integration of seaports into the supply chains (see Figure 3.3).

The discussion in this section indicates that currently seaports implement quality management practices derived from ISO and total quality management. In comparison to quality management adopted by other service organisations, quality management for seaports tends to focus more on the environment (ISO 14000), security (ISPS code) and human resource factors such as education, training, and leadership. Even though ISO and total quality management have several drawbacks, in the context of an independently operating organisation, ISO is still recognised as being effective and having a positive impact on organisational performance. Thus, the framework was built on an assumption that a seaport should remain ISO and total quality management compliant as part of the internal dimension where a seaport looks within the organisation itself and encompasses practices that are applied within the seaport context. The external dimension is where a seaport looks out along the supply chains that operate through the seaport.

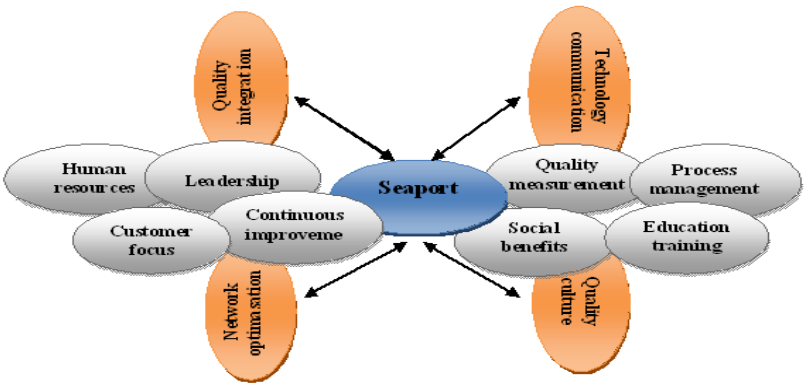
Figure 3.3. The approach of quality management for seaports in supply chains



Source: Author

It is envisaged there are two spatial dimensions for the quality management framework. The Figure 3.4 shows that the internal dimension (as presented horizontally) encompasses practices of quality management applied within the seaport. The external dimension (presented vertically), includes practices that are critical to managing the relationship between a seaport and its upstream and downstream stakeholders.

Figure 3.4. Quality management for seaports in the supply chain



Source: Author

The external dimension should include the practices that satisfy the objectives and requirements of the supply chains. To ensure an efficient movement of products along the supply chain with a minimal total cost, factors such as collaboration, coordination,

communication and integration become crucial and should be included in the external dimension of the framework. Factors such as JIT, waste elimination, process optimisation, and lean and agile structural design are the practices of supply chain quality management as discussed in the previous section. They should also be included in the external dimension of seaport quality management.

The following section explains how each proposed practice is interpreted. This study argues that seaports keep the practices and their attributes adopted from ISO and total quality management for their internal quality management (see Section 2.3). The discussions given below mainly focus on the attributes seaports need to include in their quality management when integrated in supply chains.

3.4.1 Leadership commitment

This is the most prevailing principle in the quality management literature in general, and particularly in the seaports and supply chain literature. Leadership is the pre-requisite for the success of any management activity. In supply chains, leadership becomes more important. It is responsible for developing and managing strategies and policies for the coordination and collaboration with stakeholders in the supply chains. Leadership provides necessary resources to perform quality management and encourage employees to develop their full and potential capabilitiesiers to provide the best services (Venkatesh *et al.* 1995). In supply chain circumstances, the influent stakeholders have the role of leadership. Therefore, the seaport leadership needs consider carefully expectations of the stakeholders to establish a clear, realisable target, then direct and motivate other stakeholders to cooperate to achieve the targets. This can be gained by providing a strong leadership support for quality improvement, policy deployment and communication.

3.4.2 Customer focus

In supply chain circumstances, customers include not only the end users but also many in between users. However, the problems with quality in supply chains are caused by misunderstandings between stakeholders, an example of inefficient communication. Therefore, seaports and all supply chain stakeholders should have to pay attention to the needs and expectations of all users. These needs and expectations can be identified in each process of supply chains. The end users will be satisfied if all the members of the supply chain can satisfy the needs of their upstream users. Therefore, any stakeholder in the supply chain should be treated as a customer. However, seaports may have stakeholders of different levels of priority depending on their power and influence over other stakeholders in the same supply chains, therefore, seaports should identify the core stakeholder as the most important customer.

3.4.3 Human resources

In supply chains, human resources are very important. Many organisations having different functions require each employee understand his or her role and responsibilities in the supply chain system. Furthermore, all the employees are required to participate in quality management activities; cooperate with other employees in the supply chain throughout the daily business activities; and establish quality cross function teams. Having an integral position and an important role in the supply chain, a seaport should augment its employees' skill, knowledge and expertise so that they will be able to deal with processes and activities required by other supply chain stakeholders.

3.4.4 Continuous improvement

Continuous improvement is considered as a focus of modern quality research and practice. Stakeholders must continually improve the quality of products and services

and reduce prices to satisfy customers. In supply chain circumstances, the pressure of continual improvement is becoming greater as the markets become more competitive. Not only seaports but also the other stakeholders need to continually improve their products and services to ensure providing a constantly stable quality. This can be done by regularly reviewing and assessing policies and strategies to enhance efficiencies in all processes.

3.4.5 Process improvement

Supply chain management is a process of upward and downward integration of all key bussiness transations from original suppliers to the end users with adding more values in each process (Lambert *et al.* 1998). Organisations in the supply chain normally are involved in different processes, in which the material, financial and information flows go through (Lambert *et al.* 1998). There are many correlative processes from procurement, production, selling, processing, storage, logistics, to distribution and so on. A smooth linkage between processes and operations is therefore essential (Robinson and Malhotra 2005). These processes should be managed effectively to ensure smoothness of product movements and flows with minimal waste, lowest cost, just in time and high quality.

3.4.6 Education and training

This is another important practice which should be ready available to everybody to ensure that new knowledge and experiences are exchanged among the stakeholders. Education and training are the most important component of any change process in organisations especially in the context of global supply chains. To be successful, it is important to have the full cooperation of employees at all levels and knowledgeable

workers. Strengthening quality competence in all functions is needed (Kuei 2011) and e-learning could be used as an effective way as suggested by Milla *et al.* (2011).

3.4.7 Social benefits

Operating in a competitive business environment as a modern organisation, a seaport is valuable to the communities. Hutchins and Sutherland (2008) state that organisations are facing increasingly pressure from the society's expectations which are human rights, responsibilities to society, establishing healthy, safety, security working places and environment protection. Developing close relationship with communities through ethical behaviours becomes emerging requirement in this globalisation era of (Madu 2004; Kuei 2011). Seaports may fail to compete in environmentally market if not contributing to the social interest.

3.4.8 Quality measurements

Quality measurements are used to indicate an organisation achieves its goals (Yamin *et al.* 1999). Tan *et al.* (1998) comment that the objectives of supply chains are to increase productivity, reduce total costsin short term while in long term they aim to increase market share and profits for all stakeholders. Quality measurements of organisations use financial, operational and market criteria such as throughput, turnover, profit and loss, market share, productivity, cycle times and competitive advantage (Kim 2006; Koh *et al.* 2007).

3.4.9 Network optimisation

As the stakeholders depend on the effectiveness of the supply chain network to offer better, cheaper products with no waste, fast and reliable services, optimisation of the network is therefore crucial. It requires every member in the chain to have a flexible or lean structure that can work together to respond quickly to customer needs (Simchi-

Levi *et al.* 2008). One of the important supply chain objectives is a ability to adapt to the demand changes. Gaudenzi and Borghese (2006) call it 'reactivity'; Lee (2004) names it 'agility'. In other words, a supply chain should be flexible, agile, and lean to handle the uncertainties of the markets (Chopra and Meindl 2004; Tang and Tomlin 2008). Thus, this practice can be measured as designing an optimal and effective networkfot smooth flows of material, information and people (Kroes and Ghosh 2010), minimising reverse effects (Lee *et al.* 1997; Kok *et al.* 2005), quickly responding to market fluctuations (Kennedy 2003); ensuring just-in-time services by applying pull process, eliminating unnecessary wastes; providing a lean seaport organisational structure to reduce cycle time and total costs (Kok *et al.* 2005). Basically this practice aims to ensure the right right product is delivered in the place with the right cost and right time (Kim *et al.* 2008).

3.4.10 Information technology

This practice can be seen as a backbone of a supply chain. Facilitation of all flows, transactions and operations would not be possible without communication and information technology. This practice therefore requires the adoption of an effective information technology system, which enables seaports quickly to identify market trends and accurately analyse business data. Information technology assists organisations in determining organisation's strengths and weaknesses, dealing with customer feedbacks, forecasting market demands to align their business accordingly. In the context of supply chainssharing information among supply chain stakeholders by using electronic data interchange technology helps to reduce risks and uncertainties, and significantly improve the performance of the whole supply chain (Srinivasan *et al.* 1994). Electronic data interchange is essential for organisational sustainability. In supply chain it needs to be determined in the strategic plan becuase it will be difficult

for making the best supply chain decisions without obtaining suffircient and reliable information from these electronic data interchange systems.

3.4.11 Integrated quality management

Maintaining beneficial relationships among the stakeholders can improve the supply chain's ability to create value. In supply chain circumstances, the quality of the products is co-owned by all stakeholders. Therefore, the objective of supply chain quality management is not only for a product examination system but also for a mutual beneficial partnership. Currently the seaport activities are increasingly expanding covering many logistics activities (see Section 2.5.4), seaports may become the dominant stakeholders in supply chains. In certain cases, the busy seaports, hubports need to realise their influential positions to select the relevant stakeholders that can reduce the congestions at seaports, as consequence reduce the network's complexity, increase quality of seaport service. This also helps seaports to,, more effectively collaborate with the stakeholders, share information and technology with them. This practice therefore can be interpreted as supply chain competence (quality product, reliability); collaboration among stakeholders; employment of documented quality policies and strategies among stakeholders which commit the seaport's stakeholders to providing quality products and services; and comprehensive business-to-business framework. Selecting relevant stakeholders helps reduce complexity, unnecessary wastes, delays or stoppages in the processes.

3.4.12 Quality culture

In a supply chain, all stakeholders workin one unit organisation thus quality should be a culture throughout the whole chain (Bessant *et al.* 1994; Kuei 2008). As discussed in Chapter Two, the end users now are seeking for a better value of products and services

with lower cost. Barney (1986, p. 657) defines organisational culture as ‘a complex set of values, beliefs, assumptions and symbols that define the way in which a firm conducts its business’. It defines not only organisational employees, customers, suppliers, but also how organisations interact with its stakeholders. Therefore to meet the expectations of the customers, seaports in the supply chains need to have good image (Deming 1986), trust from stakeholder (Bessant *et al.* 1994), stable reliability, high integrity and surety among stakeholders and customers (Kuei 2008), more value added services (Panayde 2006; 2008).

3.5 Summary

This Chapter briefly overviews seaports and quality management currently used in seaports. The role of seaports in supply chains is increasingly important, quality management of seaports integrated in supply chains become essential. It is found in the literature that the common practices of quality management in generic use are in line with the practices used for seaports, logistics and maritime transportation. However in the context of supply chains, where integration and relationship between stakeholders (shipping lines, seaports, logistics providers, and other entities) are the key successful factors for the whole supply chain, communication and quality policies among the stakeholders are crucial. Based on these findings, twelve quality management practices for seaports in supply chains therefore are proposed, which comprises two dimensions: internal and external. In comparison with quality management used in a single individual seaport, the proposed quality management practices have four more practices, among them two are related to external integration with new stakeholders, while the other two are used for both external and internal integration purposes. In this regard, seaports in supply chains are expected to have eight ISO practices for internal operations and four external practices network optimisation, quality culture, quality

integration, quality of communication and collaboration that can help seaports operate in the supply chains.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

The proposed quality management practices have been developed in Chapter Three. This chapter discusses the methodology chosen to validate these proposed practices. For any research, methodology is important because it decides the success of the research. The Chapter begins by discussing the reasons for selecting the research method, which leads to the research design. The chapter then elaborates on how the data collection process was designed and conducted. To increase the validity and reliability of the data, the techniques to control bias are provived. The chapter concludes by discussing how data was coded and edited to provide a clear interpretation that can bring the most of their values.

4.1.1 Research purpose

As discussed in the previous chapters, this study aims to propose a new quality management approach for seaports within supply chains. This approach does not appear to have been addressed in the literature, thus the methodology chosen should enable exploration of the perceptions of seaport management related to quality management and seaports. Atieno (2009), Canavan *et al.* (2001) and Creswell (2009) state that the research purpose leads to the research questions that then determine the research design and the methods of data collection. Tharenou *et al.* (2007) comment that the research methodology should suit the research question, thus the best way of choosing a methodology is to start with the research questions. This approach is supported by Punch (2005), who agrees with link questions to methodology. In this study the primary research question is:

> *What quality management practices are appropriate for seaports as they become further integrated in supply chains?*

Often a primary research question can be answered through its secondary questions, which support the answer of the primary research question (Punch 2005). The business practice and literature show that seaports are currently implementing some forms of quality management. However, as discussed in Chapter Two, quality management is varied from quality inspection to lean six-sigma quality where the ISO quality standards are commonly used. This study aims to examine the current quality management in seaports and to identify new practices or factors that could be applied in supply chains. The study also questions whether the existing quality management satisfies the seaport requirements in the context of supply chains, thus the secondary research question is developed:

> *What quality management practices are currently being implemented by seaports?*

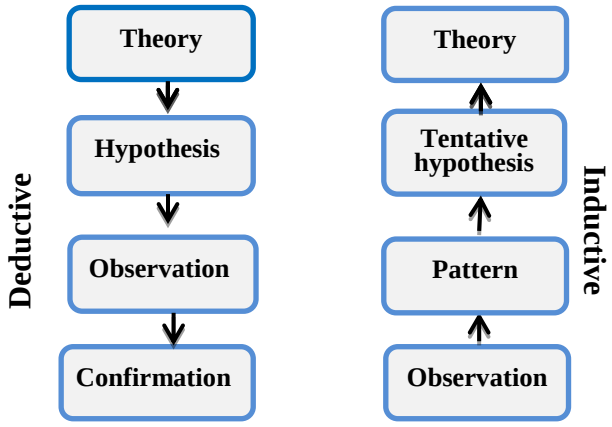
4.1.2 Methodology selection

Methodology refers to the philosophical assumptions and justification of a particular study and provides a guideline for solving a problem using specific tasks, methods, techniques and tools (Irny and Rose 2005). Some authors refer to methodology as 'a basic set of beliefs that guide action' (Lincoln and Guba 2000, p.17), epistemologies and ontology (Strauss and Corbin 1990) or paradigms (Lincoln and Guba 2000; Mentzer 2005). Creswell and Miler (2000) interpret the main discussions in these studies in a simple and comprehensive way. According to Creswell and Miller (2000) and Creswell (2009), Creswell and Plano (2011) methodology is a philosophical worldview, which reflects the researchers' beliefs in choosing a method suitable to their research and justifies that choice. Creswell (2009) argues that when conducting a study, researchers used to bring their philosophical worldview assumptions into their studies. Collis and Hussey (2003) and Morgan (2007) support this view by saying that even

though the philosophical worldviews have not been shown in the studies, they still influence the practice conducted by researchers.

Creswell (2009) and Zikmund (2010) explain that the philosophical worldview is often generated by deductive and inductive reasoning. Deductive reasoning is a logical process of drawing conclusions on something known to be true (Creswell 2009). In another words, deductive reasoning uses observations or findings that are based on a theory (Trochim 2006). This reasoning is appropriate only when literature from which a theoretical framework is defined, is rich (Creswell 2009). This reasoning comes from general (theory) to specific (observations), or from 'top' to 'bottom' (see Figure 4.1), and is associated with a quantitative research method (Trochim 2006).

Figure 4.1. Deductive and inductive reasoning



Source: Adapted from Creswell (2009), Trochim (2006) and Wallace (1971)

In the opposite case, inductive reasoning moves from the basic observations of particular facts up to broader generalisations or theories (Trochim 2006 and Wallace 1971). Inductive reasoning therefore, is the 'bottom-up' research to develop a theory based on data analysis (see Figure 4.1). Inductive reasoning is used to build new theories. However, a combination of both types of reasoning is widely accepted, according to Creswell (2009), Trochim (2006), Wallace (1971) and Whitley (2007).

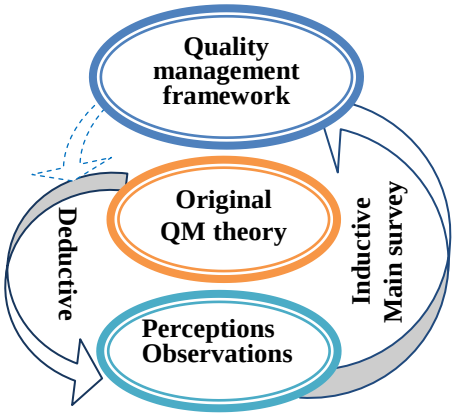
These authors explain that the combination cycles from the theory down to the observations then back up again. A new theory or assumptions then can be developed based on the observations of data collection. In much modern social and business research this combination is employed because a rapidly changing environment requires the theory, rules and practices to be constantly expanded and updated.

This study applies the philosophical worldview approach of Creswell and Plano (2011), Trochim (2006), Wallace (1971) and Whitley (2007) as it reflects the research belief and employs a combination of deductive and inductive reasoning to propose a new quality management framework for seaports in supply chains. In details, this study applies two stage methodology, where stage one is a preliminary study using deductive reasoning to (i) test an initial quality management framework built from literature, (ii) examine the relevancy of current quality management and (iii) investigate the practices that can be used for designing a proposed quality management framework. Stage two is a main study using inductive reasoning to (i) validate the proposed quality management framework that derived from the findings (respondent perceptions, observations) of the preliminary study and (ii) continues to explore the potential gaps (factors). The research reasoning approach of this study is illustrated in Figure 4.2 and explained bellow.

The initial framework tested in the preliminary study (first stage) employs deductive reasoning, which according to Corbin and Strauss (2008), Trochim (2006) and Silverman (2010) is built on the existing theory. Quality management has existed for years and has developed through an evolutionary process. For seaports, there is evidence of the use of quality management since the second generation of seaports (see Chapter Two). Even though quality management implementation in single seaports is well addressed in the literature, there is a lack of research on quality management for seaports as an important node of supply chains, covering both internal and external

dimensions (as discussed in the Chapter Three). Therefore, new practices for seaports in the context of supply chains should be explored to determine whether research is reflecting or lagging business practices.

Figure 4.2. Research reasoning approach



Source: Author

Creswell (2009), Trochim (2006) and Wallace (1971) explain that inductive reasoning is often used in explorative studies. In particular, Neuman (2003), Punch (2005), Tharenou *et al.* (2007), Winter (2000) and Zikmund (2010) suggest that inductive reasoning is incorporated in explorative studies conducted in a new area of enquiry that lacks a theory or where concepts, variables, measuring instruments and techniques are poorly defined. It is built on observations or data that address 'what' question. This study aims to answer the primary research question: 'what quality management is appropriate' and proposes a new approach for quality management. This inductive method is justified for the main study of the study.

Although deductive method exists, quality management theories are inadequate in explaining ports and supply chain. Based on inductive method, this Thesis uses a combining approach:a deductive and inductive method to further enrich and contribute to the theory and practice of quality management. It is expected that the outcomes of

the first stage and the updated literature will be useful to develop the proposed quality management framework and validate it in the main study.

4.1.3 Empirical study - Vietnamese seaports

Before selecting the research design for the study, it is necessary to discuss the empirical study chosen to validate the framework. The information of the context of the empirical study helps to design sampling, the method of data collection, and other matters related to the research methodology of this study.

In academic research, an empirical study is an approach of collecting data to derive a conclusion (Bridgman and Holton n.d.). It refers to data as evidence to formulate and test theories and come to conclusions. Through quantifying the evidence, a researcher can answer empirical questions. In other words, an empirical study should have characteristics that can provide the right answer for the research question (Sarantakos 2005).

In this study, the decision was made to conduct the empirical study in Vietnam because it provides a prime example of the integration of seaports into supply chains. This integration results from rapidly growing trade, an increase in the volume of cargo in and out the country through seaports and a number of supply chain-related governmental policies[1]. To cope with the international trade demand, Vietnam needs to

[1] The average annual growth of cargo throughputs is expected to be at 13 per cent per year, reaching 218 million tonnes by 2010, 491 million tonnes by 2015, and 854 million tonnes by 2020. Since the last decade the cargo through Vietnamese seaports have increased substantially, from 91 million tonnes in 2001 to 196 million tonnes in 2007, which is equivalent to a 197 per cent increase over the six year period period. Similarly, the containerised cargo throughput in Vietnamese seaports increased 427 per cent during the years 1995-2001 and 334 per cent during the time from 2001 to 2007 (VINAMARINE 2008). According to the Ministry of Transportation of Vietnam, the average annual growth of cargo throughputs is expected to be at 13 per cent per year, reaching 500 million tonnes by 2015, and one billion tonnes by 2020 and two billion tonnes by 2030 (MOT 2013).

ensure sufficient resources including seaport capacity, shipping fleets, infrastructure connections and human resources. This also means Vietnamese seaports should need to be an integral role in the global network of supply chains.

The maritime industry plays an important role in the Vietnamese economy as shown by the maritime dependent index being 8.6 out of 10, which is considered very high in comparison with other countries in the world (Shuo 2003). Every year nearly 90 per cent of the volume of Vietnam's foreign trade cargo passes through its seaports (VPA 2008). According to the Ministry of Transport of Vietnam, with 3,200km length of coastline Vietnam has 100 seaports (see Appendix B and Q). Of these only 14 seaports are medium-sized according to the standards of worldwide seaports (Vietnam Business News 2010).

Vietnamese seaports have limited capacity to handle large sized vessels. The common size of vessels at calling at seaports is typically small, ranging from 500TEU to 1000TEU vessels, operating as either feeder or intraregional services. Thus, the advantages and benefits of having a long coastline and many seaports are not fully utilised. Vietnam needs to have a seaport system that can accommodate the current trend of increasing size of the vessels and the seaborne trade.

Realising the requirement for integration in global trading, especially after it became a World Trade Organisation's member in 2007, the Vietnamese Government has directed the development of the maritime industry towards greater integration in global supply chains. One of the examples is the master plan approved by the Prime Minister in July 2010 to improve the national seaport system, in which the handling capacity is expected to reach 500-600 million tonnes per year by 2015, 1.1 billion tonnes by 2020 and 2.1 billion tonnes by 2030 (Nguyen 2008; Vietnam Business News 2010).

A number of other projects have been launched by the government to integrate seaports in supply chains. Firstly, Vietnam government is subsidising existing seaports to expand their value-added activities. The current projects on expanding value added services for seaports to 2020 worth US$ 2,600 million and on improving logistics activities worth US$6,000 (Japan International Cooperation Agency 2010). There is a visible lack of facilities, equipment, human resources, and management expertise to turn Vietnamese seaports into professional logistical platforms (Ly 2009). Currently, the role of the Vietnamese seaports is primarily a gateway for goods coming in and out of the country. This traditional role should be extended by providing logistics and value-added services within the premises of the seaports. The seaports should be the strategic points to seamlessly link with other modes such as trucks, rails and shipping through the improved coordination. Furthermore, value-added services can be provided if seaports can serve as inventory control points by incorporating advanced warehouse functions within the seaports.

Secondly, Vietnamese seaports have placed a considerable effort into obtaining the ISO accreditation. Many Vietnamese seaports obtain ISO quality assurance. For example, Haiphong seaport is ISO 9001:2000 certified by the Quality Certification Centre of Vietnam QUACERT and the United Kingdom Accreditation Service UKAS (Haiphong seaport 2008). Ben Nghe seaport is ISO 9001:2000 certified by Det Norske Veritas, and Qui Nhon seaport has ISO 9001:2000 certification (Qui Nhon seaport 2008). While obtaining this certification is a common practice in seaports worldwide, of interseted that the certificates are merely used as a marketing tool rather than being a real commitment to quality improvement in these seaports. Pantouvakis (2006) argues that the implementation of the ISO quality series cannot fully cover individual customer

requirements and having this quality assurance certificate is not a guarantee of quality service output.

Thirdly, there has been a number of significant seaport rehabilitation, relocation, and new seaport development projects in Vietnam (see Appendix Q) to increase their capability to accommodate bigger containerships (VINAMARINE 2008). It is known that only nine of Vietnam's seaports can be upgraded to handle 50,000 DWT vessels or those of 3,000TEU capacity (Vietnam Net 2007). Although the container traffic through Vietnamese seaports, especially in the south, has a great potential, the current maritime infrastructure limits the access of large containerships. For example, in most existing Vietnamese seaports, the depth of their accessed channel is generally not more than ten meters (Nguyen 2008). Furthermore, some Vietnamese major seaports are physically located on the rivers. This has led to uncertainty over the current usage and maintenance of these seaports and their channels (Vietnam Business News 2010). To attract the large ocean-going vessels the seaport channels need to be dredged deeper.

More specifically, in the north (see Appendix Q, section A), the government has launched the US$ 150 million project of Lach Huyen international seaport gateway, and the first deep-water seaport, Cai Lan, to receive containerships of up to 5,000 TEUs (VINAMARINE 2009). In the centre (see Appendix Q, section B), the Van Phong international transhipment project worth US$ 650 million has been commenced (Vietnam Business News 2010). The advantage of having a deep water channel more than 22 metres and being close to the main international maritime routes will make the Van Phong international transhipment seaport a global mainline operator in deploying mega-containerships (9,000 - 12,000TEUs) of the global East-West or North-South routes, according to Vietnam Business News (2010). In the south (see Appendix Q, section C), despite handling 58 per cent of the nationwide container volume in this

area, seaports in Ho Chi Minh have only shallow water depths of 8.5m causing many delays and failures to accommodate larger-sized vessels. At Cai Mep-Thi Vai Port, a construction work for 14 meter deep terminals has already commenced. There is a need to relocate and combine Thi Vai – Cai Mep, SP-PSA Thi Vai terminal, New Port Cai Mep terminal, HITV Thi Vai terminal. Once these projects are completed, seaports will have the advantage of more than 10 meter-deep berths and modern handling equipment. They are expected to attract larger containerships and change the current assignment of vessels on existing routes to and from Vietnam (Vietnam Business News 2010).

Fourthly, infrastructure connections are being upgraded. The need to improve freight transfers between seaports and the road network, railways, loading bays and the barge delivery areas, is becoming increasingly important (Ly 2009). Hai Phong and Danang are the only two seaports in Vietnam with full connection to their hinterland by road, rail and inland waterway. Seaports in Ho Chi Minh area suffer heavily from badly maintained roads. The only mode of transport to reach Dong Nai and Binh Duong provinces is by barge, which is inconvenience, time-consuming and inflexible. Inadequate infrastructure is the reason for the high logistics costs in Vietnam, which tend to be higher than China, Thailand or Japan (Vietnam Investment Review 2004; Thai and Grewal 2004).

Vietnam has embarked on aggressive programs to improve seaports, road, rail and waterway infrastructure (Ngoc 2008). However, it is worth to note that, in many new seaport investment projects such as Cai Mep Terminal and Thi Vai seaports, the construction of terminals has been completed while access roads to the seaport are still at the preliminary phase. There is currently no plan to expand the rail network linking these seaports to the national rail network. That leads to 90 per cent of the traffic at the new terminals in Cai Mep-Thi Vai having to be barged downriver from Ho Chi Minh

City. As a consequence, there is congestion at terminals and in the city (Lloyd's List 2009). The Vietnamese government may need to review these current existing projects on the infrastructure connections.

Fifthly, seaports invest in projects to improve handling productivity. Compared to other countries in the region, the volume of containers through Vietnamese seaports has increased substantially, but the productivity of Vietnamese cargo handling has halved resulting in economic inefficiency (Vietnam Investment Review 2004). The inefficiency can be seen in the number of damaged cargoes, high handling costs and time-consuming handling activities.

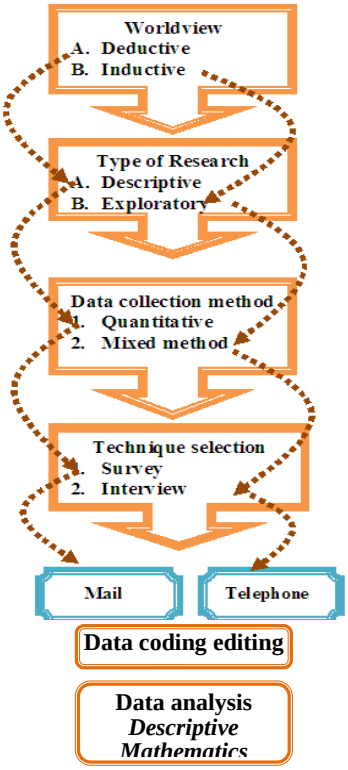
To prepare the future seaports and increase the quality of seaport service, the Vietnamese government has made a large investment on new seaport buildings and upgrading the infrastructure, facilities and equipment. However, there has been little development on management skills, human resource and new technology. To some extent, these investments are considered unnecessary and wasteful due to a lack of efficient planning. Eventually, Vietnamese seaports will be a part of supply chains. Given the current situation of Vietnamese seaports, it could be difficult for them to be a critical part of supply chains. However, the increasing growth of international trade and the changing government policies are encouraging seaports to integrate further with supply chains.

The brief review of Vietnamese seaports indicates that this seaport system is suitable for an empirical study. Although these seaports are inefficient and less competitive, they are currently preparing to work in supply chains. Using a substantial investment to upgrade the infrastructure system does not guarantee the success for Vietnamese seaports. They may need to implement a suitable quality management technique for their long-term sustainability.

4.2 Research design

The discussion in Section 4.1.2 indicates that a two-stage methodology combining a deductive and inductive approach is employed for this study. The research process of this study is illustrated in Figure 4.3 and is discussed in the following sections.

Figure 4.3. Research process design



Source: Author

4.2.1 First stage - preliminary study

The initial quality management framework, as discussed in the Chapter Three, was developed from evaluating the practices (i) in the different phases of quality management evolution, (ii) from supply chain quality management and (iii) the factors for seaports to be successfully integrated in supply chains. As it appears to be no other similar study in the literature, the initial quality management framework attempts to investigate the perceptions from seaport management.

Lancaster *et al.* (2004) suggest a preliminary study is a crucial element for a good study. Teijlingen *et al.* (2001) explain that using a preliminary study provides researchers with the ideas, approaches and the clues a researcher may not have foreseen before conducting the main study. The ideas and clues then increase the chances of getting clearer findings in the main study. It enables researchers to evaluate their usefulness to the data through initial statistical and analytical results. Researchers may be able to make alterations in the data collection, thus the data analysis in the main study is efficient (Mason and Zuercher 1995; Teijlingen *et al.* 2001). Zikmund (2010) supports the view that by providing the probable outcomes in a preliminary study, researchers can deal with potential issues that may arise in the actual study. Thus, a preliminary study is popularly used in science and business management. Moreover, Polit *et al.* (2001) explain that a preliminary study greatly reduces the unanticipated problems because a researcher has an opportunity to redesign the main study, thus all potential problems can be fixed before conducting a real survey. It also often provides sufficient data for a researcher to decide a direction for a main study that makes the main study's results are more accurate.

In this study, the quality management framework for seaports in supply chains adopts a new approach, which incorporates both internal and external dimensions. Thus, the preliminary study tests the initial framework derived from the literature. Firstly, it aims to examine the current quality management practices undertaken by seaports and determine their suitability for seaports integrated in supply chains. The preliminary study also investigates the practices or factors in the seaport industry that have not been addressed in the literature. Secondly, the preliminary study determines whether Vietnamese seaports are the right samples. In the preliminary study, all Vietnamese seaports including small and provisional were selected. It could be the case that not all

these seaports will be involved in supply chains. A preliminary study helps to select an appropriate target sample for the main study. As a consequence, the reliability and validity of this study will be improved. Thirdly, there may be some overlap between logistics and supply chain concepts as revealed in the studies of Bowersox and Closs (1996), Cooper *et al.* (1997) and Jacobs and Hall (2007). The questionnaire in the preliminary study will provide the respondents with a brief explanation on the differentiation of these two concepts. This may help to increase the reliability of the responses. Fourthly, since the purpose of the main study is to conceptualise and validate a proposed quality management framework, the appropriateness of the questionnaires for the main study will be carefully taken into account. Thus preliminary study is important to eliminate unnecessary questions. Finally, the preliminary study acts like a signpost, gaining the attention of seaport managers who may be interested in improving their quality management. These managers may contribute more insights and valuable responses in the main study.

In terms of choosing a method of data collection for the preliminary study Creswell (2009), Morgan (2007), Rubin and Babbie (2011), Trochim (2006) and Wallace (1971) state that the type of research decides the method of data collection. These researchers also indicate that deductive reasoning approaches usually use the descriptive and explanation types of research. The explanation (causal, correlation) types are used to clarify why and how there is the relationship between two aspects of a phenomenon (Rubin and Babbie 2011). This study does not aim to discuss the relationship or causes and effects, thus an explanative type is not relevant for this study. Descriptive research is used to describe systematically, a problem, phenomenon or characteristics of the research problem and provides information or attitudes about a research issue (Creswell 2011; Zikmund 2010). Zikmund (2010, p. 55) states that descriptive research addresses

the questions ‘what’, ‘who’ and ‘when’ and it may be developed from exploratory research. Referring to the primary and secondary research questions and the purpose of the preliminary study it can be seen that the descriptive type is relevant for this stage.

Teijlingen *et al.* (2001) and Zikmund (2010) argue that a descriptive study can use either quantitative or qualitative methods to collect data. Creswell (2009), Kelle and Erzbeger (2004) and Rubin and Babbie (2011) comment, a quantitative method is used when research needs accuracy, measurements, generalizability of a symptom and convenience. A quantitative instrument is easy to administer and amenable to rapid statistical analysis. Thus for the purpose of the first stage, which is testing the initial framework, this study uses a quantitative method. Hoyle and Harris (2002), Marshall and Rossman (1999) and Zikmund (2010) recommend the survey technique as a quantitative method. According to these authors, a survey is the most appropriate tool for making inferences about groups of people or to compare and explain knowledge and perceptions. The preliminary stage aims to test and investigate perceptions of seaport management, thus the survey technique was relevant and selected.

Several types of surveys can be undertaken, for example, model specification, experiments, mail questionnaires and internet surveys as suggested by Lancaster *et al.* (2004) and Morgan (2007). Model specifications and experiments are often used in the scientific studies while business research often uses internet and mail survey (Phelps and Fisher 2007). Even though an internet survey is low in cost, time effective and able to cover a large sample size, it may have a very low response rate depending on the internet access of respondents (Zikmund 2010). Moreover, the differences in capabilities of the respondents’ computers and software may make the survey more difficult or quality of data less reliable. Given the concern that Vietnamese seaport management might not frequently use internet surveys and there may be a difference in

using software and computer language, the internet survey was not chosen for this study.

It appears that a mail survey is suitable for this preliminary study, although it has disadvantages, for instance, it is time consuming, there may be a low response rate if no incentive is applied, and thus large sample is needed (Creswell and Miller 2000; Punk 2005). However, a mail survey is a cost-effective and efficient way to gather data from a large geographic coverage (Zikmund 2010), thus it is widely used in business research. It is also reliable because it is free from the bias of the interviewer and respondents have adequate time record give their perceptions (Creswell 2009; Punk 2005; Zikmund 2010). The preliminary study aims to target all official Vietnamese seaports to test the initial quality management framework and to identify potential issues in seaport management for investigation in the main study. Thus, a mail survey is a relevant instrument for this study.

4.2.1.1 Sampling

To get the sampling size for the preliminary study, the official lists of Vietnamese seaports had been searched and crossed checked to ensure that all seaports are included. It appears that there are two official lists. One list is from the Vietnamese Port Association (VPA) website, which includes 55 members. The other list is from the website of the Ministry of Transportation of Vietnam, which covers 100 different seaports including those of VPA. The preliminary study purpose (as discussed above) requires a large sampling, thus list from the Ministry of Transportation of Vietnam was selected for the preliminary study. The details of these 100 seaports including their names and contacts are provided in Appendix B. By selecting a list with a large number of seaports, the preliminary study was expected to obtain valuable, sufficient and rich

information for the proposed quality management framework, which will be validated in the main study.

4.2.1.2 Questionnaire design

A research instrument is important as it decides the success of the research (Bryman 2002; Neuman 2006; Tharenou 2007). In quantitative research especially in mail surveys, questionnaires are preferable because they can be standardised and highly structured (Tashakkori and Teddlie 1998). Saunders (2003) recommends a self-administered questionnaire for online and mail surveys and an interviewer-administered questionnaire for telephone interview surveys.

This preliminary study is a mail survey, a self-administered questionnaire was employed. The questionnaire consists of three parts (Appendix F; G). Part A was designed to ask about for quality management currently being implemented in seaports. Part B attempted to test the initial framework for seaports in supply chains; it consisted of 12 practices and 50 attributes derived from the literature. Part C aimed to get the demographic information of the seaports and the respondents. The questionnaire structure is described in Table 4.1.

Table 4.1. The preliminary study questionnaire structure

	Preliminary study (stage 1)		
	Likert-scaled Questions	Open-ended questions	Other questions
Part A		1	3
Part B	15		
Part C	50		1
Total	70		

An advance letter with the letterhead of the research institution is prepared (Appendix D). The letter clearly explains the purpose and importance of the study and expressed appreciation for the valuable contribution of the respondent who participated in the

survey. The full ethics approval granted by Tasmanian Ethics Committee, the name and number contact of a person in charge of issues were also mentioned. This assures the participants that the questionnaire has been checked by Tasmanian Ethics Committee, no questions related to organisational or personal sensitivity will be explored and information given by respondents will be kept confidential. In the advance letter, the expected deadline is given to give the signpost of when the data collecting process for the preliminary study will be ceased.

4.2.1.3 Pretesting

Before translating and sending the questionnaires out to the respondents, pretesting was conducted to reduce errors and ensure that the questionnaire was designed properly. The pretesting was carried out with eight participants from four target groups: academics, professionals in the quality management field, research students in logistics management and a person working in language consultancy. These pretesting respondents were selected based on the researcher's judgement to obtain feedback from a variety of sources as suggested by Cahoon (2004). The pretesting participants were provided the covering letter, brief background information on the study, the procedure for collecting data for this study and the research questions (see Appendix C). They were requested to comment on not only the overall structure of the questionnaires, but also on the technical and conceptual equivalence between different terminologies. In the literature, the term 'quality management practices' is used as well as 'quality management principles' and 'quality management factors' and they may have different meanings depending on specific contexts. To avoid confusion, the word 'practice' was used in the questionnaire. The feedbacks and comments from pretesting respondents were mostly on sentence structure and the clarity and accuracy the questions. Some ambiguous and double barred questions were identified.

After pretesting, the questionnaire was then revised and sent to an expert who works in the maritime logistics academy and speaks both English and Vietnamese languages fluently. When translating questionnaires into the Vietnamese language and style, care was taken to ensure that the questionnaire was understandable and relevant to the national culture of the respondents. The pretesting is important to ensure the validity of the survey instruments (Prescott and Soeken 1998; Saunders 2003; Wilson 1998).

4.2.1.4 Preliminary results

One hundred questionnaires were sent out to Vietnamese seaport managers, 38 surveys were returned which represented a 38 per cent response rate. The results showed that three seaport chairmen (8 per cent), 21 general directors and directors (55 per cent), and 14 senior managers (37 per cent) who are involved in seaport quality management decision making. Most of them have long working experience, for instance about 20 per cent has more than ten years, 50 per cent has more than five years, and only 10 per cent of respondents had worked in the industry for fewer than three years. This indicated that respondents have sufficient working experience to provide valuable responses for the study.

As recommended by Doug *et al.* (2009) a descriptive statistical analysis was applied to determine the patterns and useful practices and attributes for the main study. The results (see Table 4.2) showed that eight internal and four external quality management practices were accepted. Respondents perceived the majority of the 50 attributes in the initial quality management framework as important (with the mean score from 3.0).

Three attributes *continuously conducting quality training and education, effective policy of stakeholder participation in quality improvement efforts, and a clear system of*

records and feedback on quality issues from stakeholders were not selected for the main study due to their mean scores below the midpoint point.

Table 4.2. The preliminary study result

	Practices/Attributes		
Sq	**Internal dimension**	Mean	SD
	1. **Leadership**		
1.	Direct involvement of leadership in quality decisions	4.65	0.62
2.	Long term commitment to quality	4.31	0.80
3.	Adequate resources for quality improvement	4.13	1.04
4.	Direct participation of top management in quality decisions	4.26	0.75
5.	Regular reviewing of quality issues in management meetings	4.26	0.75
6.	Clear quality collaboration policy with the stakeholders in the supply chain	4.10	0.86
	2. **Customer focus**		
7.	Exceeding customer and stakeholder expectations	4.63	0.63
8.	More value added services to customers	4.25	0.50
9.	Using customer complaints and feedback for quality purpose	4.55	0.76
10.	Implemented a special channel for customer complaints	4.15	0.63
	3. **Human resource**		
11.	Seaport employee's commitment in providing error free outputs	3.00	1.50
12.	Employee's participation in quality decision making	4.34	0.84
13.	Creating an enjoyable and enthusiastic working environment	4.18	1.06
14.	Maximising employee's skill, knowledge and expertise	3.91	0.74
15.	Employee's understanding of the value of the customers	3.94	0.89
16.	Enhancing cooperation among employees in the supply chain	3.00	1.00
17.	A reward system to recognise employee's quality efforts	3.86	0.90
	4. **Quality measurement**		
18.	Regular reviewing and assessing of policies, strategies, processes	4.05	0.86
19.	Using a quality committee/team to improve quality	4.05	1.16
20.	Improvement program aims to find time and cost losses in all processes	3.19	1.58
21.	Tracking and fixing root causes and quality problems	3.81	0.95
	5. **Process management**		
22.	Improvement program aims to find time and cost losses in all processes	4.15	0.75
23.	Understanding major supply chain flows and process to reduce waste	4.39	0.67
	6. **Continuous improvement**		
24.	The development of comprehensive quality plans and procedures	3.02	1.32
25.	A comprehensive goal-setting process for quality	4.44	0.76
26.	Using a self-assessment program to identify strength and weakness	4.05	0.92
27.	Using KPI indicators for seaport operations and management measurement	4.02	0.85
28.	Using reports from internal and external audits for quality improvement	3.15	1.77
29.	Determining key performance indicators for seaport operations and management	3.86	0.77
	7. **Training and education**		
30.	Training and education should be provided to everyone in the seaport	3.57	0.72

31.	Using reports from auditors, business performance and customer feedbacks for quality training purposes	4.00	0.73
32.	Ensuring the competency of employees by providing frequent training and education	3.39	1.17
33.	Continuously conducting quality training and education	3.86	0.66
34.	Implementing education and training on quality for top management and employees	2.60	1.42
	8. **Social benefits**		
35.	Effective policy on safety	4.02	0.91
36.	Effective policy on security	3.78	1.09
37.	The obligation of making a contribution to the public interest	3.11	1.59
38.	Effective policy on environmental management	3.86	0.74
39.	Social responsibility to the regional community	3.60	0.59
	External dimension		
	9. **Quality integration**		
40.	Selecting a new stakeholder for the supply chain based on their quality of services and products	3.00	1.66
41.	Effective and long term collaboration and cooperation with stakeholders	3.84	0.97
42.	Effective policy of stakeholder participation in quality improvement efforts	2.97	1.30
43.	Technical, operational, commercial assistance availability to stakeholders	3.79	0.84
44.	A formal commitment of stakeholders to provide at least the same quality of services and products	3.38	0.92
	10**. Information and technology**		
45.	Application of an effective information technology system	4.05	0.86
46.	Effectiveness of the information channel among stakeholders	4.02	0.85
	11. **Network optimisation**		
47.	Designing for an optimal and effective network	3.71	1.06
48.	Use one link ERP system to minimise the total costs	3.82	0.67
49.	A clear system of records and feedback on quality issues from stakeholders	2.96	1.49
	12. **Quality culture**		
50.	Building trust and openness within supply chains	4.15	0.71

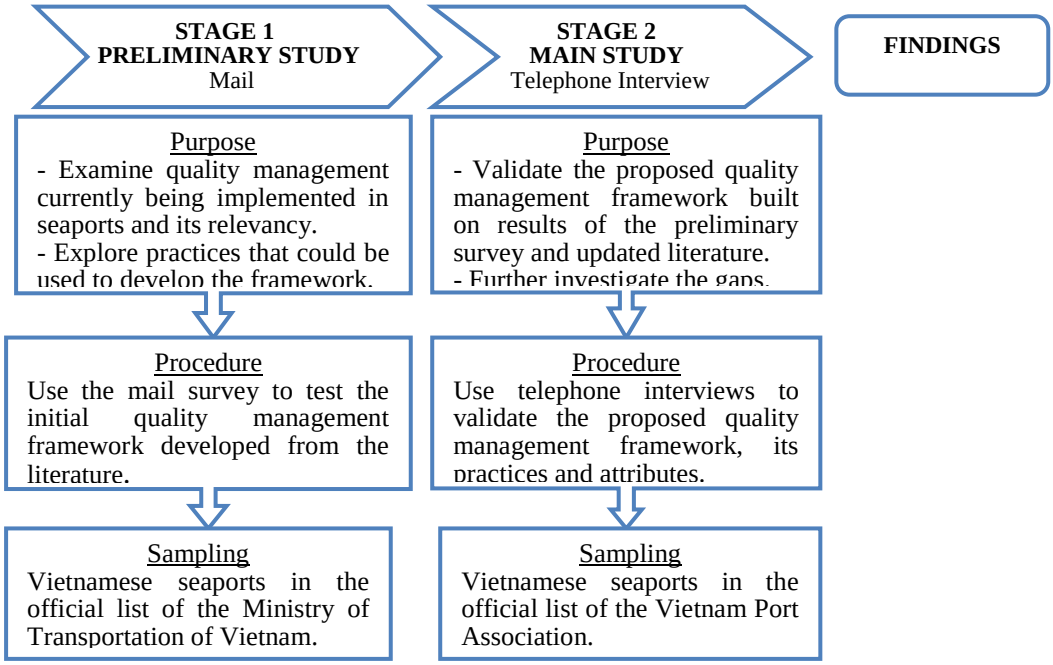
The respondent concerns and suggestions include the influence of a key stakeholder, the factors that facilitate supply chain processes, the optimal supply chain structure to reduce costs, the possibility of using one intranet to link and share benefits and risks in with stakeholders in supply chains were considered for further and in depth investigation in the main study. The respondents also questioned (i) how and to what extent a seaport should integrate into supply chains and (ii) whether a seaport should remain as a normal integrated node or become a critical, dominant node of supply chains. Based on these recommendations and the recent supply chain literature, the

additional questions were designed to include in the instrument of the main study. In relation to convenient methods to collect data, the respondents suggested a telephone interview for the next stage. This is shown in the words of a technical seaport manager.

> *Daily, we have to handle a large amount of paper works. As managers, we do not have time to fill in the first survey and send it back, even though the study is in our interests. The best way is to ask directly by face-to-face or call. However, calls are preferred as we may be committed with other works.*

From recommendation, a telephone interview appears a good and convenient way for the seaport managers. In terms of sampling, the respondents suggested that the main study should focus on the seaports being integrated or having potential to work in supply chains. The process of data collection is illustrated in Figure 4.4.

Figure 4.4. Data collection process



Source: Author

It is worth noting that the results of the preliminary stage are not included in the results of the main study as recommended by Doug *et al.* (2009), Prescott and Soeken (1998) and Teijlingen *et al.* (2001). However, the preliminary questionnaire is included in the

full study because it determines the feasibility of the full study and the appropriateness of the survey instrument (Teijlingen *et al.* 2001) while exploring the potential area for the research according to Lancaster (*et al.* 2004) and Saunders (2003). These authors explain that including the preliminary questionnaire into their full study enables the full studies to capture the data they are looking for. As the result, a full study will be more accurate and reliable. Thus, a preliminary study questionnaire looks very much like a full study questionnaire. Even Prescott and Soeken (1998) and Yin (2003) suggest that if possible the method that is used in the full study should be applied in the preliminary study. If done correctly, the preliminary study guides the right direction for the researcher to conduct a successful research project. This study used the preliminary questionnaire as a frame to develop a questionnaire for the main study.

4.2.2 Second stage - main study

While the preliminary study employed deductive reasoning, this main study used inductive reasoning. The purpose of the main study is to validate the proposed quality management framework, which was developed on the outcomes of the preliminary study and the most recent supply chain literature. They include the practices accepted in the preliminary study (see Section 4.2.1.4), the recommendations from the respondents, which were not discussed in the preliminary study.

The main study employs a mixed method of data collection: quantitative and qualitative. Burns (2000), Creswell (2008), Whitley (2007), Williamson (2005) and Winchester (1999) argue that the mixed method allows a researcher to cover both deep and broad aspects of the research question and enables to enhance internal, external and construct validity of the findings. The main study aims to (i) reconfirm the findings of the preliminary study, which used the quantitative method and (ii) explore other potential related issues, which uses the qualitative method as suggested by Blaikie (2009) and

Zikmund (2010) for an explorative research. Mentzer (2005, p. 159) explains that the qualitative method provides ‘an in-depth description of a specific program, practices or settings’ and focusses on a process, implementation, development and the participant’s perspectives that lead to the outcomes of the research (Hoepfl 1997; Neuman 2003; Patton 2002). The research questions of this study are related to the perceptions of seaport management on the implementation of quality management practices, thus the mixed method is relevant for the main study.

Focus groups and interviews are the common techniques using for explorative research (Carr and Worth 2001; Punch 2005; Trochim 2006). The focus group technique has disadvantages, which cannot be used for this main study. The disadvantages are (i) the results cannot be generalised, (ii) interpretation problems may arise if the sampling has not been selected in proper way, (iii) high potential bias from interviewer and interviewees may occur because the sampling is selected in purposive way (Blaikie 2009; Frankland and Bloor 1999). This technique, therefore, is not selected for this main study.

Interviews appear to be the relevant option for this stage because they are able to probe more deeply, adaptable conducive to building trust and rapport that encourage respondents to openly contribute to the research (Denzin and Lincoln 1998; Gall *et al.* 1996; Frey 1995; Seidman 1998). The central value of the interview as Brenner *et al.* (1985) argues is that it allows both parties, the interviewee and interviewer to explore the meaning of the questions and answers involved. In addition, interviews give rapid, immediate responses, and permits collection of the most extensive data and a variety of data within the same interview (Carr and Worth 2001).

An interview can be conducted by face-to-face, web conferencing or by telephone. A face-to-face interview has the highest cooperation and response rate (Punch 2005). It

allows longer, more complex interviews (Sturges *et al.* 2004). However, it is costly, requires a longer data collection period and may have a high influence from the interviewer, large costs of various categories, for example, setting up and travelling to and from the interview location, transcribing the interview and analysing the interview (Gillham 2000). An internet interview is cost-effective but produces a low response rate (see Section 4.2.1.2). It can be seen that a face- to-face and web conferencing interview are less relevant to this main study.

A telephone interview was selected to collect data for this main stage. Carr and Worth (2001), Coderre *et al.* (2004) and Sturges and Hanrahan (2004) recommend the advantages of telephone interviews for business research. Firstly, telephone interview can easily overcome problems of wide geographical access; people from all different places can be interviewed (Coderre *et al.* 2004). Secondly, it is convenient for sensitive issues, for example, respondents might be reluctant to discuss them by face to face or to physically step out of their closed sites (Sturges and Hanrahan 2004). Thirdly, this technique allows people to schedule an interview suitable to them; they can choose the time and the duration for an interview compatible with their available hours (Gillham 2000).

Although the telephone interview has many advantages, it also has disadvantages. One of the disadvantages in invisible communication is the reduction of social cues (Healy and Perry 2000). Since the interviewer is unable to see the interviewee and vice-versa, it is more difficult to obtain additional information via body language, tone and facial expression. However, the telephone interview reduces influences from both sides (Kirk and Miller 1986; Healy and Perry 2000) because no physical involvement. This disadvantage could be useful for controlling bias. Another disadvantage of telephone interview is the session needs to be recorded. The quality of tape recording depends on

the equipment (Burke and Miller 2001), and a speaker-phone is recommended. The tape then needs to be transcribed, which might be time-consuming for a researcher. However, tape recording and transcribing enable a research to double check thus data collected is more accurate. It is true for Sturges and Hanrahan (2004, p. 107) to conclude that 'telephone interviews are not better or worse than those conducted face-to-face' given telephone interview is cheap, more convenient and accessible than face to face interview.

4.2.2.1 Sampling

The Vietnamese Port Association seaports were selected for sampling in this main study. As discussed at the previous section, two websites of the Ministry of Transportation and the Vietnam Port Association provide the official and reliable lists of and information about Vietnamese seaports. The seaports listed on the Ministry of Transportation website were used for the first study; thus seaports of the Vietnam Port Association were used for this main study. It is worth noting that even though the number of Vietnam Port Association seaports is only half of the total number of Vietnamese seaports listed in Ministry of Transportation website, they handle from 85 per cent to 90 per cent of the total cargo throughput of the country (VPA 2009). They are commercial from medium to major size seaports, which have potential to work as part of supply chains and are located in different geographical regions of the country. Hence VPA seaports can be representative of the country's seaport system.

Moreover, the respondents in the preliminary study recommended using the Vietnam Port Association members for the main study. This sampling selection is in line with the studies of Punch (2005) and Creswell (2009). These authors found that the sampling for an explorative research is mostly purposive since the overall validity of

the research design, sampling and parameters should be aligned with the purpose and the questions of the research. In addition, the sampling selection must enable researchers to bring the most values to their study while minimising bias.

4.2.2.2 Questionnaire design

Care is needed in the design of the instrument in the main study to maximise the validity and reliability of the study. As indicated previously, this main stage employs telephone interview survey for data collection. Atieno (2009) and Creswell and Plano (2011) suggest a good instrument design is essential to avoid bias because the interviewer bias may lead to the response bias.

Burke and Miller (2001), Cavana *et al.* (2001), Car and Worth (2001), Gillham (2000) and Sturges and Hanrahan (2004) state that interviews can be categorised as highly structured or highly unstructured or semi structured. A structured interview uses an interview sequence and predetermined questions, and is conducted in exactly the same way in each interview (Gillham 2000). This type of interviews consists of administering structured questionnaires with trained interviewers asking fixed choice questions in a consistent format (Car and Worth 2001). However, a structured interview is designed in a strict way that does not allow interviewees to provide additional information therefore an interviewer may not capture some insightful contributions (Seidman 1998). In opposite, an unstructured interview is conducted without the use of an interview sequence (Hair *et al.* 2003). This allows a researcher to collect varied data because interviewees are able to freely discuss the researched area (Cavana *et al.* 2001). Due to its unstructured organisation, the interviewing outcomes may be too broad, so that an interviewer can find it hard to focus on the required research (Burnard 1994).

This is more likely in an interview with a limited timeframe. Thus, unstructured and structured interviews were not selected.

Between structured and unstructured interviews there is the semi-structure interview, in which as explained by Sturges and Hanrahan (2004) a researcher is free to explore information by following up the responses of interviewees. An interviewer is able to ask related questions that were not initially included in the questionnaire. These interviews have an overall structure and direction, but they provide the flexibility to include unstructured questioning (Campion *et al.* 1994; Hair *et al.* 2003). Bryman (2002) supports the position that an interviewer is able to ask follow up questions if necessary.

Semi-structured interviews usually demand greater knowledge of the subject by the interviewer than structured interviews. Creswell and Plano (2011) suggest a semi-structured interview would be useful for further understanding respondents' perceptions and beliefs in the preceding mail surveys. In this study, the preliminary study was designed to test the initial quality management framework and explore initial feedbacks of respondents; it did not cover in depth all aspects of the study. Thus, a semi-structured interview was an appropriate choice for this main stage. A number of open-ended questions were added to get more valuable information as suggested by Denzin (2009). Using a semi-structured interview allows the researcher to validate the practices and attributes in the proposed quality management framework. At the same time the additional questions enable a deeper exploration of the interviewees' perceptions and their beliefs through the answers.

The questionnaire of this main study used Likert Scale questions and open-ended questions (see Appendix O). From the preliminary study 47 out of 50 attributes of the initial framework were selected and presented in likert scale questions for

reconfirmation in this main study. The Likert Scale questions were used because they elicit details easily and quickly from respondents as suggested by Ellis (2010) and Nakagawa and Cuthill (2007). A five-point Likert Scale with a midpoint was applied to get more accurate response (Corbin and Strauss 2008).

To provide the respondents an opportunity to explain their viewpoints in details 19 open-ended questions were added. Open-ended questions give more scope for respondents to answer freely, therefore more information and perceptions can be captured (question C1.7; C3.8; C8.11; C9.7). The open-ended questions added aimed to further explore the factors or potential issues that seaports in supply chains should have. To allow for 'any exceptional or unusual responses' (Alreck and Settle 1995, p. 108), the forced choice, dichotomous and multiple choice categorised as ‘other questions’ were included (question A.2, A.6) to keep the interview process interesting and stimulating for the respondents. Varying the question types in the questionnaire may make interviewees more involved and reduce bias or early terminations as suggested by Cahoon (2004).

In details, Part A of the telephone interview questionnaire was designed to obtain the demographic information including seaport organisational and respondent profiles. Part B was designed to collect information on quality management practices currently being implemented. Part C explored perceptions on quality management practices for seaports in supply chains (see Appendix O; P). As mentioned in the previous section, 47 attributes from the preliminary study with the mean score above 3.0 were selected for the main study. Forty four additional questions based on the respondent recommendations in the preliminary study and updated information from literature review was included in the main study (see Table 4.3). The practices safety management, security management and environment management in the Table 5.1 have

been grouped to the practice ‘social benefits’ into Table 6.1 due to these practices have similar attributes, which are emphasising on the responsibilities to human and society. The questions were designed in a clear, simple, easy way that would be spoken distinctly and understandably as recommended by Arnon and Reichel (2009), Coderre *et al.* (2004), Maxwell (1992) and Lindquist (1991).

The guidance on designing an interview questionnaire provided by Cavana *et al.* (2001), Coderre *et al.* (2004), Hair *et al.* (2003), Neuman (2006) and Zikmund (2010) was used to avoid the complexity, ambiguity, leading, loaded and double-barrelled questions, jargon and slang language, implicit negatives, dangling alternatives. An effort on simplifying all questions that might not be familiar to the respondents while keeping their original meaning (technical norms) was made. This was achieved through pretesting and the translation process

Table 4.3. The main study questionnaire structure

	Stage 1			Stage 2		
	Likert	Open	Other	Likert	Open	Other
Part A		1	3	0	3	3
Part B	15			15	5	0
Part C	50		1	73	11	1
Subtotal	65	1	4	88	19	4
Total			**70**			**111**

The length of an interview, as suggested by Arnon and Reichel (2009), Blaikie (2009), and Irvine (2010), should be short, simple and precise. It means the number of the questions should be kept to a minimum and structured in a logical consequence moving from easy to more difficult items. Approximately 30 minutes was allocated for each interview (as indicated in pretesting). Besides the time length, the convenience of the time frame was also considered. Creswell (2009) explains that where expectations were clearly established in relation to the length of interview, and respondents understood

the research objectives, they were generally willing to agree to be interviewed. During the interviews, this study found that the convenient time for having an interview with seaport management is during lunch time or after work, when the respondents are free from calls, work interruptions and are able to provide the accurate and valuable answers. In this survey, more than 50 per cent (22 interviews) of interviews were done after work and about 35 per cent (15 interviews) in lunch time and 15 per cent (6 interviews) in the early morning. This may recommend the most convenient time for researchers who use telephone interviews as the method of data collection.

Before conducting the interview, an advance letter and the response cards were sent to each seaport manager (Appendix J), in which the title of the study has remained unchanged from the preliminary study. Using the same tittle in two stage of data collection could facilitate interviewing because the respondents were aware of the study from the preliminary study. The gap between the first and the main study allowed respondents sufficient time to provide valuable contributions if they found the survey interesting and useful. This makes the quality of the data of main study more reliable and useful.

4.2.2.3 Pretesting

Similar to the preliminary study, pretesting was applied to ensure that the instrument was designed in an appropriate way. Carr and Worth (2001) explain that a telephone interview is not physical involvement thus controlling the bias of interviews becomes crucial. A pretesting package was sent to three groups consisting of five academic experts, three seaport managers, and four research students to test that the instrument was designed in a clear, understandable and appropriate way. The pretesting check list was developed from suggestions of Cahoon (2004) (see Appendix I). After collecting

pretesting feedback, the questionnaire was translated into Vietnamese and pretested again with one Vietnamese maritime lecturer and one Vietnamese research student that had a quality assurance background[2]. All these steps were to make sure the questionnaire was designed to gain high valued responses.

Due to no physical involvement, the interviewer has to be competent and able to control the interview's flow, as well as making room for the interviewees to express their opinions (McCormic *et al.* 1993; Sturges and Hanrahan 2004; Wilson 1998). Moreover, the interviewer can control the quality of the result. It was important to organise and rehearse the interviewing process before beginning a formal survey, so that the bias caused from uncontrolled events can be reduced to a minimum as suggested by Cahoon (2008). Two rehearsal interviews, one in English and one in Vietnamese were carried out to minimise the potential problems that may arise later.

4.2.2.4 Conducting a telephone interview

Prior to conducting interviews, the interviewee office phone numbers, names of respondents and their email addresses were obtained through the website of the Vietnamese Port Association. They were then double checked with the list from the Ministry of Transportation used in the preliminary study. As suggested by Arnon and Reichel (2009) and Cahoon (2004; 2008) an advance on using the university letterhead was used to give 'a professional appearance' (Cahoon 2004, p. 207). A participation information sheet and a consent letter approved by University of Tasmania ethics

[2] This Vietnamese research student worked at Haiphong Private University as Deputy Director of International Office. She obtained a certificate on quality assurance granted by Chat luong vang – Vietnam in 2007 and has research interest in academics' conceptions of evaluation and rewarding of teaching; and quality assurance in tertiary education.

committee were delivered to respondents a few days prior to commencing the interview. To facilitate the interviewing process, two response cards (see Appendix M) were sent to the respondents in case the respondents may have difficulties in providing their responses in some questions (Arnon and Reichel 2009; Cahoon 2004; 2008). The response cards were designed and categorised in the same configuration of questions to facilitate coding and data processing later.

Each advance letter addressed the seaport manager by name. Response cards were included with each advance letter to increase the response rate as suggested by Carr and Worth (2001), Kuusela and Simpanen (n.d). Larvakas (1993) suggests that a response rate of 60 to 80 per cent could be obtained by using an advance letter. The advance letter (see Appendix K) stated that the seaport manager would be contacted over the next few days to participate in the interview. Before making an appointment with the respondents, a confirmatory note (see Appendix N), in which the name of a participant, the details of the interview includes his/her acceptance or refusal time and date, was prepared. As the main study aimed to get the maximum number of invited respondents and obtain as many answers related to the questionnaire as possible, in the confirmatory note, two short questions were designed for those respondents who were unable to participate in the telephone interview. As suggested by Cahoon (2004). Corey and Freeman (1990) also explain that if a respondent is not willing to provide an answer to a particular question or questions in an interview, a researcher should be able to form some indication that may lead to compose another chance where this would be appropriate.

During the initial contact made via telephone, the research student explained the survey purpose and thanked the respondents for the insights and contributions provided during the preliminary study. At the start of each interview, the interviewer explained the

purpose of the study and asked for permission to record the conversation. Their anonymity and data confidentiality was also assured. In addition, the format of the interview was explained and indicated.

To ensure the reliability of interviewee responses, the research student checked with interviewees to clarify any doubts or enquiries about the interview. The appropriateness of communication facilities such as telephone, recorder, printed questionnaire and confirmatory note for each interview was also prepared and checked carefully to ensure the accuracy and quality of interviews. To increase the response rate, follow-up emails and calls were made to respondents, who were unable to participate in the first calls as suggested by Cahoon (2004, p. 211). Another attempt was a number of reminding calls has been made during the maritime logistics conference, which was held in April 2010 by Vietnam Maritime Administration[3]. Using conference time for reminder calls was useful, as 14 respondents were happy to allocate their time for interviews in a few days right after the conference finished, while three seaport managers agreed to have interviews during the conference after they completed their sessions.

A key strategy during the interviews was to make respondents feel comfortable and able to freely express their thoughts (Cahoon 2008; Irvine 2010). To achieve the highest quality of an interview, suggestions from Arnon and Reichel (2009), Coderre *et al.* (2004), Mathieu and St-Laurent (2004), Kvale (1996) and Maxwell (1992) were the main focuses. They suggestions include (i) be knowledgeable with the topic, (ii) outline

[3] The Maritime and Logistics Conference and Exhibition was held by 'Meet the Buyer' Marine Asia – 2010, a leading trade fair for Marine industry in Asia and Vietnam Maritime Administration on 21-24 Apr-2010 at Ho Chi Minh City, Vietnam. This is a programme of one to one appointments between senior purchasing managers and senior buyers from leading international ship owning and management companies with suppliers from all areas of marine industry.

the procedure of the interview, (iii) be gentle, tolerant, sensitive and patient to provocative and unconventional opinions and (iv) control steering the course of the interview to avoid digressions from the topic, (v) retain the information from the interviewees, (vi) interpret what was said by the interviewee.

To encourage interviewees to provide more in-depth perceptions the research student asked additional sub-questions. Prompts and probes were used to encourage the interviewee to explain more about their answers. Before conducting Part C, which proposed the framework, the concept of a supply chain, its elements and the difference between supply chains and logistics were all explained. It was important to ensure all interviewee respondents understood what they were going to answer. This helped to catch interviewees' attention on the important parts and make an interview interesting. The approach taken with questioning was to reduce the scope for bias during the interview process and increase the reliability of the information obtained.

Secondary data was used in order to save time for respondents and to increase response rates. Before conducting an interview, the respondent was asked how long he could be available for an interview. Depending on the time length, the order of the questionnaire may be changed and prioritise the part that can provide the valuable information for the study. An example could be seen in the interview with the manager of seaport 5, who was able to allocate only ten minutes for the interview. Thus, he was asked to focus on the part B of the questionnaire and a follow-up email with the questionnaire then sent to him to complete the survey. In general, the average length of interview was approximately 45 minutes ranging from 10 minutes to 140 minutes.

After interviewing, at the end of each interview, the research student thanked the interviewee. A summary of the answers was checked with the interviewee to ensure that the answers were correctly understood. The notes with the time recorded for the

interview were used to double check with the records to make sure important information was recorded in the accurate way. By doing this validity and reliability of the date is enhanced. In appreciation of their participation, a copy of the results summary was offered to. The interviews were later transcribed and translated from Vietnamese to English afterwards. Some interviews were followed up in order to supplement missing data from the first occasion of interviewing. The interviews were later transcribed and translated from Vietnamese to English afterwards.

After completing all interviews, one way independent T test (Appendix R, Section C) was used to compare the answers on the similar questions brought from the preliminary study to the main survey. The result shows that the responses on approximately 80 per cent of the questions were remained unchanged. The differences were found in the responses on cutomer focus (C1; C3), quality performance (QF3; QF4) and quality improvement (CI1; CI5). The reason could be the sequence of the similar questions and the format of questionnaires in two stages (see Section B in Appendix F; Section C in Appendix O). The other reason could be in twelve month time the perceptions of seaport managers might be different because of the changes in business reality or economic envinronment. Given the seaport activities are increasingly expanding towards supply chains, the customer and quality performance concepts need to be adjusted in the new business environment context.

4.3 Data coding and editing

As suggested by Cooper and Emory (1995) and Rubin and Babbie (2011), after collecting, the data was edited to ensure that it was accurate, consistent with other information, uniformly entered, complete, and arranged to facilitate coding and tabulation. Editing is the process of making data ready for coding and transferring to

data storage to ensure the completeness, consistency, and reliability of the data (Johnson 1997). Editing also involves checking to see if respondents understood the question and scanning for missing answers (Hair *et al.* 2003). It facilitates the coding process and therefore is an indispensable activity in the whole scientific research process. Editing becomes more important in relation to responses to open-ended questions of interviews and questionnaires, or unstructured observations (Cavana *et al.* 2001). In this study the editing process included searching, scanning for missing answers, checking for errors in case if two answers were in conflict with each other and checking for inconsistencies between questions (Johnson 1997).

Hair *et al.* (2003) explain that data can be coded before or after collecting. This is the process of classifying answers by assigning numerical or symbols to group the answers for rapid and flexible storage, retrieval, and tabulation (Boyatzis 1998; Zikmund 2010). Boyatzis (1998), Neuman (2006), Punch (2005), Zikmund (2010) and Rubin and Babbie (2011) elaborate on two types of codes: descriptive and inferential codes. Descriptive codes are mainly used to summarise segments of data, whereas inferential codes pull together material into small and more meaningful units (Neuman 2006; Punch 2005; Zikmund 2010).

In this study the questionnaires were designed in both fixed alternative and open-ended questions, the coding of these responses was also conducted differently. Responses to all fixed-alternative questions (quantitative data) in questionnaires were pre-coded at the designing process (questions A2; A3; B4; C14). The open-ended questions (qualitative data) were coded after transcribing all interviews. The qualitative data was analysed based on the mathematical method (see Section 5.2) then coded on the main themes of the answers rather than words as suggested by Zikmund (2010). All coded responses were then entered in the coding book in SPSS 19.0 for later analysis.

4.4 Control bias

In academic research validity and reliability determine the quality of a research, from 'bad' to 'good'. They are also used to control bias (Altheide and Johnson 1994; Cavana *et al.* 2001; Hair *et al.* 2003; Zikmund 2010). The discussion in the section 4.2 indicates that this study combines quantitative approach (mail survey) in preliminary and qualitative approach (telephone interview) in the main study. This section explains how the reliability and validity were undertaken in this study.

4.4.1 Reliability

In academic research, reliability refers to consistency, dependability or replicable results if the study was conducted all over again and not affected by any circumstances (Bryman 2002; Lewis and Ritchie 2003). Reliability is widely used for testing or evaluating quantitative research, in qualitative research it is about methodology design, the methods of conducting a research (Sarantakos 1994). Charles (1995) supports that the consistency (or stability) can be assured when the responses on a questionnaire remain relatively unchanged through the tests or retest method at different stages. A high degree of stability indicates a high degree of reliability. Understanding the nature of research reliability can minimise bias and increase the quality of a research.

In this study, the proposed practices were selected from quality management practices in generic use, in supply chains and in the maritime logistics segment with consideration of successful integration factors for seaports (as discussed in Chapters Two and Three). These proposed practices were then tested in the preliminary study to reselect the most suitable measurements (here means practices) for the framework. Therefore, the proposed practices was measured and tested twice, the bias and uncertainties in relations to the research measurements was controlled.

In term of methodology design, Rubin and Babbie (2011) state that a threat to the reliability and validity of research may come from the sampling selection. Before conducting survey, the empirical case study was considered and justified carefully to assure that the target sampling is relevant and dependable (see Section 4.1.3). Moreover, the sampling was selected from only official and reliable sources. As discussed in the sampling section (Section 4.2.2.1), in particular only two official governmental websites providing a list of Vietnamese seaports with contact details (see Appendix B and H), are used in this study. Thus, the sampling bias could be avoided.

The reliability threat comes from the design of the research questionnaires, which includes several common instrumentation errors such as ambiguity of wording, double-barrelled or inapplicable questions, unstated criteria, over-generalisation, over-specificity, over-emphasis, leading questions (Creswell and Plano 2011). The questionnaires in the two stages in this study were pretested, translated double checked and polished (section 4.2.2.3), thus the instrument bias was minimised.

The reliability of research requires that the participants have sufficient opportunities to describe their experiences and inform the researcher of their perspectives (Lewis and Ritchie 2003). In the preliminary and the main study, particularly in the main study, the open-ended questions were added for the participants to share more information. This was constantly carried out in each interview by asking: ‘Is there anything else would you like to share?’, ‘what is your view in this matter’. Kirk and Miller (1986), Sarantakos (2005) and Kurmar (2005) suggest, the participants should be provided all information related to a specific research, thus in the advance letter of each stage information about this study purpose, process, and timeframe was given to the respondents. Unclear issues were explained when making an appointment and during interviewing.

4.4.2 Validity

Whilst reliability in academic research refers to a consistency, validity refers the accuracy, trustworthiness, credibility (Lincoln and Guba 2000) or appropriateness, meaningfulness of a particular study (Perakyla 2003). In the view of Modell (2005), it means that the findings of a particular study truly represents the phenomenon a researcher claims, thus validity is 'assured' rather 'test for' (Patton 2002). Validity can be attained by applying a number of strategies, among which member check, triangulation, verification, using standards are most suggested in qualitative research (Lincoln and Guba 2000; Creswell 2008; Kvale 1996; Morse and Richard 2002).

Member check is a process 'played back' to the informant to check for perceived accuracy and reactions. Thus unclear responses or misunderstandings can be adjusted or fixed. In this study the responses on key items were double checked by asking 'what do you mean by that' during interviewing, summarizing after each interview, taking notes and recording (see Section 4.2.2.4).

This study uses a triangulation approach, as discussed above. This combines inductive and deductive reasoning (see Section 4.1.2), quantitative and qualitative methods for data collection (see Sections 4.2.1; 4.2.2), descriptive statistic data and mathematical analysis system (see Section 5.2). This approach strengthens the validity of findings.

In term of verification, Meadows and Morse (2001, p. 191) claim that the methodology should be coherent to 'ensure congruence between the research question and the components of the method'. In this study each step related to methodology was carefully justified to assure that the approach chosen is appropriate to answer the research question. This will lead to increase the validity of the study. In term of standardisation, Morse and Richards (2002), Maxwell (1992), Miles and Huberman

(1994) comment that the main threats to validity can be inadequate description, mistaken interpretation, theoretical threats, researcher bias, and reactivity. Neuman (2006) and Sarantakos (2005), suggest strategies for reducing and eliminating validity threats. They are (i) employing a listening strategy to avoid leading and influencing the respondents to their responses, (ii) comparing and contrasting the collected data with the relevant literature, (iii) applying a coding system that excludes other possible viewpoints in data analysis, and (iv) adopting a low-interference strategy in drawing and verifying conclusions.

In this study, special care was taken to minimize the influences from the interviewer and interviewees. The interviewer may stimulate different answers to respondents and therefore gain an inaccurate response. For example, by giving unclear instruction or guidance, interviewees may over- or under-state their opinion leading to misunderstanding. Therefore, the respondent was briefly informed about the supply chain concept, the difference between a supply chain and logistics and other unclear issues that may mislead. A neutral and friendly interviewing voice was used to minimise the possible influences from the interviewer and the leading questions. Kirk and Miller (1986) and Healy and Perry (2000) suggest that the interviewer should ensure the respondents have sufficient opportunities to describe their experiences and their perspectives, thus theadditional questions such ‘anything else you would like to say about...?’, ‘could you explain more?’, ‘what is your idea’ and ‘how do you think?’ were added in this study. The bias may come from the interviewees, who participates but may be sensitive to answer some certain themes. Therefore the interviewees can choose to refuse in details these themes.

All interviews were recorded and important points were noted during interviewing. They were then transcribed and double checked to assure their relevancy. After each

interview, the key information were summarized and rechecked with the respondents in order to assure that no misinterpretations and misunderstandings had occurred. However, as Sarantakos (2005) and Boyatzis (1998) suggest, by using a comparative strategy to contrast interview data with the relevant data in the literature, a quick check of the findings with sources used to formulate a conceptual model was made to assure that there is no abnormal or misunderstood answer.

As discussed in Section 4.2.2.4, both qualitative and quantitative data were coded and rechecked in the editing process before analyzing. A limitation of the qualitative approach is that the findings reported or interpreted in the ways that may be different from one researcher to another (Coderre *et al.* 2004; Mathieu and St-Laurent 2004; Kvale 1996; Zikmund 2010) To overcome this perceived limitation, all interviewers in this study were audio recorded and transcripts were rechecked to ensure the comments and findings were correctly interpreted by the researcher. In addition, an error control process was adopted during designing questionnaire, conducting interviews, coding and processing data as discussed above. That had a strong emphasis on reducing bias and increasing the accuracy and reliability of the drawn conclusions.

4.5 Summary

This Chapter has outlined the research methodology for this study. The philosophical worldview's discussion indicated that a combination of deductive and inductive reasoning should be employed in this study. Consequently, a two stage survey was designed, in which a preliminary study is used for deductive reasoning and main study employed inductive reasoning. As the supply chain concepts could be new for Vietnamese seaport managers, the preliminary aimed at initially testing whether these quality management practices are still suitable for seaports, thus a quantitative method

using a mail survey was selected. The results of the preliminary study shows that this study is worthy for further investigation and Vietnamese seaports were suitable samples for both surveys. The majority of quality management practices and their attributes of the initial quality management framework were accepted in the preliminary study, thus they are selected for the main study. Moreover, a number of suggestions from the preliminary study were used to design the questionnaire for the main study. By discussing the method of data collection, method of bias controlling and coding process this Chapter provides sufficient information for selecting data analys techniques which will be used for interpreting the findings of this study in the next chapter.

CHAPTER FIVE

CURRENT QUALITY MANAGEMENT IN SEAPORTS

5.1 Introduction

The main discussion in this chapter focuses on how current quality management practices are perceived by Vietnamese seaport management. The information given by the respondents from the main survey was analysed to answer the secondary research question: *What quality management practices are currently being implemented in seaports?* To answer this question, information on the seaports and respondents was given to examine whether demographic factors have an effect on the respondents' viewpoints. Through discussion related to the current quality management in seaports, the chapter also examines the relevancy of these current quality management practices in the supply chain context.

The study uses triangulation approach for collecting data as disccused in Chapter Four, thus the chosen method of data analysis is addressed. The outcomes of the data analysis determine whether the current quality management practices are still accepted by seaport management for their fifth generation.

5.2 Method of data analysis

The data collected in this study was a combination of quantitative and qualitative. Quantitative data used statistical test while qualitative data used the mathematical analysis. There are two types of statistical tests researchers usually use in business researches: parametric and non-parametric. Non-parametric procedure is used if more than one assumption is required for a parametric procedure is not satisfied, for instance (i) a population parameter and its value; (ii) the form of the population distribution; and (iii) measurement at the interval or ratio scale of measurement. In greater detail, the application of a non-parametric statistical procedure is appropriate if the sample size is small, with a population of less than 30 (Statsoft

2003), the distribution is not normal, or the main variables are measured by a nominal or ordinal scale (Keller and Warrack 1991). In this thesis, the sample size of the main survey is 43, which is large enough to employ the parametric statistical procedure.

In term of the scale of measurement, Keller and Warrack (1991) argue that the choice of using a statistical procedure is based on an ordinal scale should depend on whether the data measured are categorical or continuous (interval level data). If interval level data can be assumed, then parametric statistical procedures should be utilised. This relates to the Likert Scale, which uses interval techniques as the norm in contemporary social sciences (Creswell and Plano 2011; Huberman and Mile 1994; Rubin 2010). In social and business studies, the use of scales with values 'strongly agree', 'agree', 'disagree' , in which have an order and equal distances between the values is common (Cooper and Schindler 2011; Rubin 2010). The majority of the questions in questionnaire (Appendix F, Q) indicated that the variables used in this study are spaced out in equal interval. Thus, the use of a parametric statistical procedure is relevant in this thesis.

This study used a multivariate data analysis package including descriptive data analysis to select the relevant quality management practices (Appendix R, Section B). ANOVA test at 0.05 significance level is used to examine the tendency, commonality and differences in perceptions among seaport managers, who have different working experiences; T test is applied to compare the consistence in responses between two stages (Appendix R, Section C). For the quantitative data, the major descriptive statistical measurements, which are mean scores, standard deviations and percentage (Neuman 2006, Tharenou *et al.* 2007) were used. For the qualitative data collected through open ended questions, a cluster technique and

thematic analysis based on the contents as suggested by Boyatzis (1998), Cavana *et al.* (2001), Gillham (2000) and Seidman (1998) were applied. The combination of these analysis techniques enhances the quality and insight of the data.

A mean is the sum of the total values divided by the number of values (Neuman 2006, Zikmund 2010). This measurement provides precise values that are easy to manipulate, interpret and compare with one another. This measurement is also a measurement of central tendency, which provides more powerful analysis, because a researcher can see how the data are distributed between two extreme values (Zikmund 2010). The mean scores of the responses on the primary and secondary research questions of this study were provided in Appendix R, Section B.

A standard deviation often comes along with the means. The mean describes the central location of the data, and the standard deviation describes the spread (Neuman 2006, Zikmund 2010). According to George and Mallery (2003) and Neuman (2006), widely deviating data points can make the data meaningless. Standard deviation shows how far the data is dispersed from an expected value, for examples an average mean. A data with a low standard deviation means that it is close to the mean. Moreover, standard deviation is commonly used to measure confidence in statistical conclusions (Huberman and Miles 1994, Cavana *et al.* 2001). Based on these central descriptive measurements, the practices and attributes of the model will be empirically accepted or rejected accordingly. The standard deviations of the responses on the primary and secondary research questions of this study (see Appendix R, Section B) spreading in the small range from 0.5 to 1.01 satisfied the requirements of this study.

This study applied percentage measurement for both quantitative and qualitative data. Percentages are used to express how large number of respondents having the

same or similar perceptions in one variable. For examples, in quantitative data, this measurement indicated how many percentages of the respondents perceived important or not important to the specific question. In qualitative data, the percentage measurement used to identify the key pattern of the answers on the open ended questions.

5.3 Demographic information

As mentioned above, the demographic information on seaports and the respondents (sampling units) is used to segment the perceptions for further analysis. All Vietnam Seaport Association (VPA) members were invited to participate in the main survey. Throughput of the seaports covered ranges from 78,000 tonnes (Quang Binh, Cua Viet seaport) to 31 million tonnes (Saigon seaport). It is worth noting that due to time limitation, medium and big seaports with an annual throughput of more than 250,000 tonnes were the priority targets for the main survey. Among the 55 VPA members, 43 seaports completed the main survey and together they accounted for an overall throughput of 155 million tonnes or 5.5 million TEUs in 2009, and 151 million tonnes or 6 million TEUs in 2010 (see Appendix R, Section A). These 43 seaports represent 78 per cent of VPA members in terms of number, and 99 per cent in terms of total throughput in 2009 and 2010. More importantly these are national and commercial seaports, which are either involved or have the potential to work in the global supply chains. Therefore, the response of 43 seaports, which is 79 per cent (of VPA members can represent the response rate for this study.

The remaining 12 seaports are small (see Appendix R, Section A) they are highlighted in light blue colour). The average annual throughput of 250,000 tonnes

indicated that a seaport may handle only about 20,000 tonnes per month which is equivalent to one shipment of a mega size bulk carrier or 350 TEUs per month. The annual total throughput of these 12 seaports represented only 1.6 per cent in onnage and 1.09 per cent in TEUs of VPA's annual throughput. Their potential for working in global supply chains is limited. These seaports either provide services for the minor local needs; operate for special purposes such as ship repair (Cong Nghiep Tau Thuy), fishery (Ben Dam-Con Dao); or are simply jetties receiving cargo for the local community (My Tho-Dong Thap seaport); or are being constructed (Cai Mep International, Tan Cang-Cai Mep International). Excluding these 12 seaports does not affect to the results of the survey, therefore data collected from 43 seaports are eligible for this study.

5.3.1 Seaport information

VPA seaports have varied characteristics and thus the perceptions of their managers might also vary. To facilitate data analysis and bring out the insightful value of the data, the seaports were grouped into four categories: size, major activities, location and ownership (see questions A5 and A4; Appendix 0), which are the attributes that differentiate seaports from one another. These four criteria are discussed in the following sections.

5.3.1.1 Seaport location and major activities

This section summaries the information given by the respondents to question A4. According to seaport managers, the size of seaports vary, they can be divided into three groups: small seaports with an annual throughput from 250,000 tonnes to one million tonnes, medium seaports from one million to five million tonnes, and the

large seaports handling over five million tonnes per year. The details of each group are provided in Appendix R, Section A.

In response to the question on the percentage of major cargo handled (question A6), the findings reveal that only a few of the seaports are specialised seaports with three handling containers, four handling liquid petroleum, three handling bulks and the remaining being combined seaports. In the interviews, most respondents have not provided an estimated percentage of major cargo handled in their seaport (question A6) thus only the major cargo handle is used (seeAppendix R, Section A)

The seaports in Vietnam are categorised by by the Ministry of Transportation of Vietnaminto three regions: the northern regional group, the central regional group and the southern regional group (see Appendix R, Section A). The northern regional group includes nine seaports or 21 per cent of the total number of VPA seaports. Even though the number of seaports is small, this seaport group handled more than 31 per cent of the VPA cargo throughput. For example, in 2009 and 2010 the northern group handled 48.7 million and 55.7 million tonnes respectively of general and bulk cargo (equivalent to 31.4 per cent and 36.8 per cent of the total VPA throughput) and 1.76 and 1.37 million TEUs, equivalents to 32.2 per cent and 22.7 per cent of total throughput in terms of TEUs. Among these nine members, two are specialised bulk seaports, one for coal (Cam Pha) and one for petroleum (Xang Dau B12). The other seven seaports handle a combination of bulk, containerised and general cargo. This group is strongly influenced by the control of the government.

The number of seaports in the central regional group is 11, which represents 26 per cent of the VPA membership. They handled only approximately 10 per cent of general and bulk cargo and two or three per cent of containerised cargo of annual VPA throughput. They are small to medium seaports and three seaports are

specialised. Quy Nhon is a bulk cargo seaport, Da Nang is a petroleum seaport and the other are combined seaports (Ky Ha-Quang Nam).

The 23 seaports in the southern regional group encompasses over half (53 per cent) of the VPA membership. In 2009, this region handled 92.7 million tonnes of cargo and 3.48 million TEUs, which are equivalent to 60 per cent and 63 per cent of the national throughput respectively. In 2010, the achievement was 76.8 million tonnes and 4.18 million TEUs equalling 51 per cent and 69 per cent respectively. The major and biggest seaports are located in this region. Among the 23 seaports, five are specialised with two containerised seaports (VICT and Tan Cang) and three seaports that handle petroleum (Cat Lai Oil, Saigon Petro and Nha Be Oil seaports). The remaining 18 seaports handle a combination of containerised and general cargoes. The largest seaport of the region and in the country is Tan Cang which handled 33 million tonnes of cargo and 2.46 million TEUs (35 and 70 per cent of the total regional throughput) in 2009, as well as 31 million tonnes and 2.8 million TEUs representing 40 per cent and 68 per cent of the total regional throughput in 2010.

In summary, in terms of annual throughput, the southern region seaports form the largest group, followed by the northern region and the central region seaports. According to the respondents, the location of seaports is important as it reflects the influence of the government and the management bodies over seaport activities. It seems that seaports in the northern region are more strictly supervised by the government because perhaps due to being closer to the ‘national government’ according to the respondents.

5.3.1.2 Seaport ownership

Seaport ownership in Vietnam is diversified and can be mainly classified into two major groups: ministry and local government (see Figure 5.1)

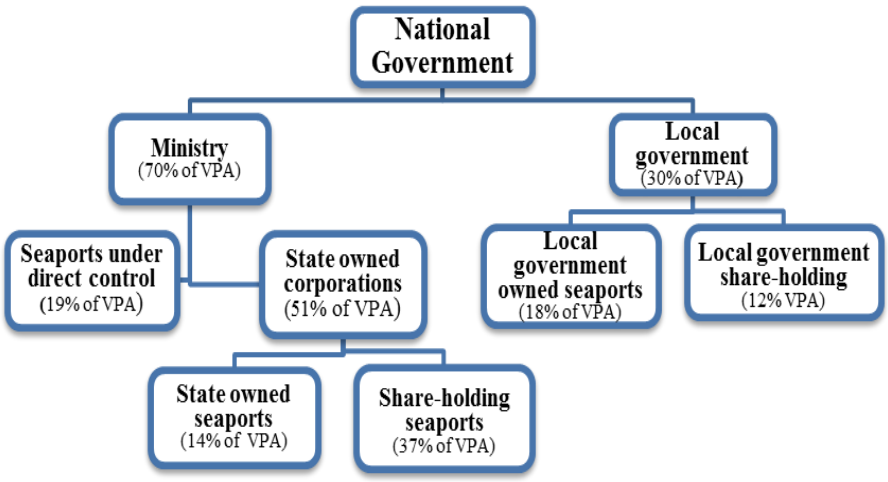
5.3.1.2.1 Ministry

Ministries control and own seaports thought two types of ownership (i) under direct control of ministries, and (ii) through state owned corporations, which then can be divided into two groups: (a) the state owned seaports and (b) shared holding seaports. There are eight seaports (19 per cent) that belong to the ministries. The Ministry of Defence has direct control over two seaports, which are Ky Ha-Quang Nam and New Port Saigon. Cang Rau Qua is under the management of Ministry of Agricultural and Rural Development and this seaport specialises in handling agricultural cargoes. The Ministry of Planning and Investment licenses five (12 per cent) international joint venture seaports including Phu My, Vietnam International Container Terminal and Singapore PSA seaports. They are build-operate-transfer (BOT) and build transfer (BT) investments with the Vietnam authorities contribute lands and the international groups contribute by investing in facilities, equipment and technology. As such, activities of these seaports must comply with the regulations on foreign organisations imposed by the Ministry of Planning and Investment.

There are 22 seaports (51 per cent of VPA members) under the control of state owned corporations. There are six state owned seaports (Quang Ninh, Cam Pha, Hai Phong, Dinh Vu, Xang Dau B12, Quy Nhon and Saigon port) contributing 14 per cent in terms of the number of VPA members covered in this study. Sixteen seaports are share-holding seaports account for 37 per cent of the survey population.

Among them, seven seaports are from the southern region (Cai Cui, Dong Nai, Cai Lai Oil, Saigon Petro, Nha Be Oil, Can Tho, and An Giang); five are from the central region (Nghe Tinh, Da Nang, Thi Nai, Nha Trang and Chan May) and four are from the northern region (Dinh Vu, Doan Xa, Vat Cach and Transvina). These share-holding seaports are under government and private ownership.

Figure 5.1. Vietnamese seaport ownership



The largest state owned corporation having control and management of 17 seaports (about 40 per cent of the VPA members being surveyed in this study) is Vietnam National Shipping Lines (VINALINES). Its seaports altogether have an annual throughput of 69 million tonnes (45 per cent of VPA throughput) and 2.28 million TEUs (42 per cent) in 2009, 58 million tonnes (38 per cent of VPA throughput) and 1. 9 million TEUs (32 per cent) in 2010. Most of these share-holding seaports of VINALINES are listed in Vietnamese stock exchange according to the respondents. The remaining three corporations are Vinafood (controlling Tranoc seaport), Vinacoal (controlling Cam Pha seaport) and Petroleum (controlling Xang dau B12) (seeAppendix R, Section A.)

5.3.1.2.2. Local government

Local government owners of seaports include urban or provincial authorised bodies. The total number of seaports in this group is 13, representing 18 per cent of VPA memebers. Eight seaports (19 per cent of VPA members) are local government owned. Some seaports are under the control of their Urban People Committees, such as My Tho, Vinh Long, An Giang, Cua Cam (Hai Phong Urban People Committee) and Ky Ha (Quang Ngai Urban People Committee). Two provinces are responsible for their own seaports, which are Khanh Hoa Province (Cam Ranh seaport) and Phu Yen Province (Vung Ro seaport). Five local government share-holding seaports, which account for 12 per cent of the VPA members, are joint investments between the local government and other investors. Examples are: Hoang Quan Mekong and 620 Chau Thoi Co. Ltd invested in Binh Minh seaport, Samco limited company in Ben Nghe seaport, Lotus joint venture in Bong Sen/Lotus seaport, and Vung Tau joint commercial company in Vung Tau seaport. Vung Ang seaport belongs to Ha Tinh Commercial and Mineral Corporation.

It appears that the diversification of Vietnamese seaport management system has resulted in some basic problems as pointed out by the respondents. The seaport administration is controled by the different ministries and local authorithies. The seaport investment is not equal among seaports, therefore, sometimes they are done for specific requirements of their ministry. The Vietnamese government attempts to formalise its authority over all seaports, including both publicly and private seaports, through mainly two organisations, VINALINES and VPA. VINALINES is a direct supervisor and operator of a large number of seaports whilst the VPA is a communication centre connecting the seaports through a representative to the government. The VPA also has a responsibility to assist its members in need of

managing financial development, service quality improvement and seaport quality improvement. The VPA plays an important role in international commercialisation of the seaports.

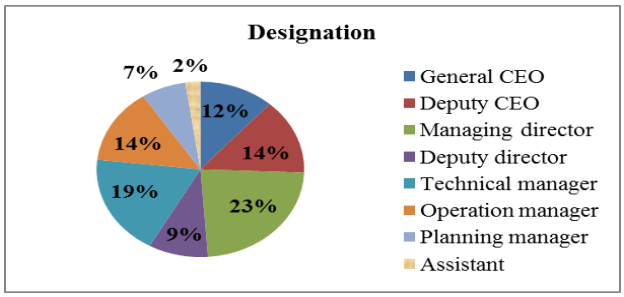
5.3.2 Respondent demographic information

This section covers the information of the respondents including their position, professional training and work experience. Data about the respondents was categorised into three groups to examine whether selected respondents are eligible for this study. It was expected that the respondents would be experienced and knowledgeable in quality management because they are either top seaport leaders or in charge of quality management nominated by the seaport top leaders as explained in Chapter Four.

5.3.2.1 Respondent position and working experiences

The designations of the respondents (question A1) are varied, from operation manager, general managing director, deputy manager, managing director to planning manager, technical manager, and marketing manager. For the statistical analysis, these designations were classified into two groups.

Figure 5.2. Designations of the respondents

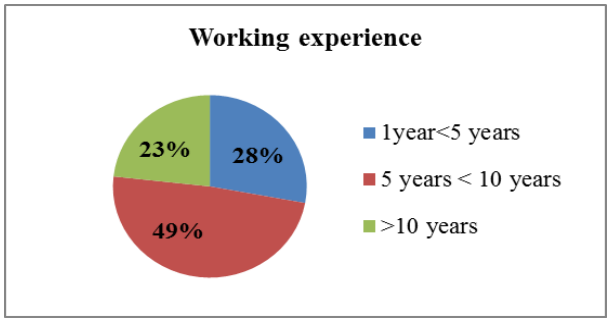


The senior management group (58 per cent) includes positions such as general managing director (12 per cent), deputy general director (14 per cent), managing

director (23 per cent) and deputy director (9 per cent). The middle management group (42 per cent) includes positions such as operation manager (14 per cent), technical manager (19 per cent), planning manager (seven per cent), and assistant marketing manager (two per cent) (see Figure 5.2).

As mentioned in Chapter Four, an advanced letter addressed to the respective top leader was sent to each seaport, followed by a phone call requesting to assign another person to participate if a seaport top leader was busy. Although the 43 respondents may work in different positions, they all were directly responsible for or in charge of quality management in their seaports.

Figure 5.3. Working experiences of the respondents

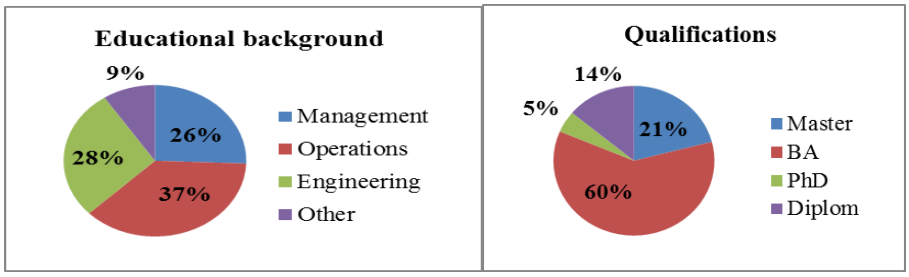


In relation to work experience, the respondents were asked about their length of tenure. The result shows that 8.07 year is the average work experience at their seaport. For the purpose of perception comparison, seaport managers are classified into three groups. Group one includes twelve respondents (28 per cent), who have working experience of one to five years. Group two includes 21 seaport managers (49 per cent) with working experience of five to ten years. Group three includes ten respondents (23 per cent) with working experience of more than ten years (see Figure 5.3).

5.3.2.2 Professional education background

The education background of the respondents shows that they are highly qualified in different maritime areas. Figure 5.4 shows that 37 per cent of the respondents have educated in operations education, 26 per cent in management, 28 per cent in engineering education and 9 per cent in other education. These numbers reveal that the majority of the respondents obtained the relevant education that is required by the seaport industry. This also indicates that the respondents are able to professionally contribute to the survey.

Figure 5.4. Education background of the respondents



In terms of the qualifications, two respondents have doctorates in management (five per cent), nine obtained master degrees (21 per cent), 26 have bachelor degrees (60 per cent) and 6 respondents (14 per cent) hold diploma certificates (see Figure 5.4). Most respondents have not gained quality management qualifications, but they do have working experiences related to quality management, because quality management is a part of the seaport strategy, policy and operational management.

As shown in Appendix R, Section B, the respondents from joint venture seaports have the shortest years of working experience but the highest combined education qualification (management and operation). The respondents from Vinalines seaports have the longest work experience with an average of 12.5 years. They have specialised education in port operation and management, and engineering. The local

seaport respondents have an average work experience of 10.5 years. In terms of education qualifications, the majority of the respondents have been awarded diplomas and bachelor degrees.

5.3.3 Summary of demographic information

The 43 Vietnamese seaports participating in the main survey represented 79 per cent of all VPA seaports. They are containerised, general liquid and combined seaports having an annual throughput ranging from 250,000 to 34 million tonnes. These seaports are divided into three groups in accordance to their geographic location. The Southern regional seaport group has the highest annual throughput while the Central regional group has the smallest. Vietnamese seaports are under two types of ownership: local government and ministry. Currently seaport privatisation is being strongly pushed by the Government and is reflected in the increasing number of joint venture seaports between the Government and international organisations.

The respondents in this study are seaport managers. They are either in senior management positions (58 per cent) or are in middle management positions (42 per cent). These seaport managers have an average working experience of 7.37 years, which is sufficient for providing valuable and insightful perspectives for the survey. In terms of education background, even though most seaport leaders do not possess a specialised professional degree in quality management, they are familiar with quality management due to it is included in seaport policies, strategies and planning. Therefore the respondents have sufficient knowledge and are eligible for this study.

5.4 Current quality management in seaports

The number of respondents who perceived that seaports should implement quality management (question B.1) was very high. 52 per cent of the respondents strongly agreed and 22 per cent agreed. It was shown in the answers of the seaport managers:

> *Providing a service with good quality is always a target, a big concern that any organisation aims to achieve, and of course, quality management is obviously important.*
>
> Planning manager, seaport 8

> *Well, just imagine...can we go to the market and sell services without quality? Did you know that the number of seaports in Vietnam is increasing quickly, not only national organisations but international ones also want to be involved? For sure, quality is always a big concern of any seaport that wants to be successful, unbeatable. We must be good in quality.*
>
> Marketing manager, seaport 15

Only 18 per cent of the respondents indicated 'unsure' or 'disagree'. These respondents explained:

> *It is not necessary to implement quality management system; there are many ways to gain profits.*
>
> Engineering director, seaport 11

> *I think it might be important but not for our seaport, what can we get from it? Installation of new technological devices may be much more important than quality management...*
>
> Operation manager, seaport 17

To recheck the consistency of the answers in the first question, a second question (B.2) was asked whether a quality management system positively affects the performance of a seaport's service. About 44 per cent of the seaports managers indicated 'strongly agree', 22 per cent responded 'agree', and 34 per cent said

'unsure'. The respondents admitted that quality management improves the seaport performance indexes, but its achievement is far below expectations.This is reflected in the following respondent comments:

> *'Yes, it does positively affect the performance of the seaport. We have more customers coming to our seaport since we announced the implementation of ISO 9001-2000. However, frankly, we expect more than what we have now.'*
>
> Engineering director, seaport 11

> *We spent time, money, people on it, but it does not seem to work very effectively, need to examine the system*
>
> Engineering manager, seaport 5

Some other respondents pointed out that the system has just been operating for only a couple of years and it perhaps needs more time to run to know their returns on investment.

Question B.3 '*To again a comparative advantage and stay sustainable, we choose quality improvement as the most economical way rather than investing in facilities or expanding seaports'* was asked. The majority of the answers (62 per cent indicated 'strongly agree' and 38 per cent 'agree') supported that for the long-run, quality management could be used as a economical way to maintain competitiveness. There was a slight difference in the answers among seaports. The seaports, which have sufficient capacity for handling cargoes in the next coming years, agreed that quality management should be developed as an organisational culture. In their view, quality management implementation is a good strategy for long-term sustainability. In contrast, the respondents of the seaports with insufficient storage capacity hesitated that seaports should do other things more important before implementing quality management. They responded that the first

task Vietnamese seaports should do is investing more on seaport infrastructure, facilities and technology, but not quality management. This is because these seaports have the outdated facilities and a low handling productivity compared to other countries in the region thus they prefer investing on infrastructure.

The respondents commented that some major seaports, which are located on the rivers towards the inland side, for instance Saigon port, Haiphong port, should be relocated in the areas that are more accessible. The current locations limit assesses and the channel becomes shallow due to serious sediment issues, which requires these seaports often spending huge money on dredging. These respondents also mentioned the difficulty in expanding seaports because of limitation of land area. Some seaports have chosen to use inland ports in the surrounding areas like inland clearance depots or dry ports to increase their storage capacity. By expanding inland, seaports are able to minimise expenses for shipping lines, truck operators or shippers, reduce the time from customer's doors to the loading seaports, and provide more value added services to customers, for instance, custom clearance. Thus, this could be a way for small and medium seaports to stay sustainable.

Question B.4 asked about adoption of a formal quality management system in seaports. Most seaports do not use a separate department for quality management. This function is usually subsumed under the technical, planning strategy or administration department of seaports in Vietnam. The study results show that quality management ISO 9001 is popularly used in Vietnamese seaports, especially in containerised or general liquid bulk seaports. About 68 per cent of seaports have applied for ISO and the remaining 32 per cent uses either own quality management systems, or total quality management and quality control.

In more details, 29 seaports implement ISO 9001, among them 23 seaports use ISO 9001-2000 and six seaports implement ISO 9001-2008. Six major seaports are implementing ISO 9001-2008 also use ISO 14001. Seven seaports reported using their own systems, four seaports use quality control and three seaports reported using total quality management in all their areas (see Figure 5.5)

Figure 5.5. Current quality management in seaports

To understand what practices and attributes seaports incorporate in their own systems, a sub-question about the implemented practices was asked. It was found that there are similarities in implementing practices between own systems, ISO and total quality management. The only difference is that the own systems do not require the external assessments or certificates.

The respondents were asked about the importance of the 15 practices derived from ISO and total quality management (Question B.5). The results shown in Table 5.1 indicate that five most important practices are *leadership, customer focus, technology, safety management and information communication.* The five least important practices are *process management, quality measurement, environment management, quality improvement and social benefits.* Three practices *security management, supplier relationship and education and training* have similar mean scores.

Table 5.1 Current quality management practices in seaports

Practices	Min	Max	Mean	SD
Leadership	4.00	5.00	4.74	0.44
Customer focus	4.00	5.00	4.58	0.49
Technology	3.00	5.00	4.25	0.58
Safety management	3.00	5.00	4.18	0.58
Communication information	3.00	5.00	4.04	0.53
Strategy and planning	3.00	5.00	3.81	0.69
People involvement	2.00	5.00	3.60	0.65
Security management	3.00	5.00	3.41	0.58
Supplier relationship	2.00	5.00	3.41	0.58
Education and training	2.00	5.00	3.41	0.66
Process management	3.00	4.00	3.32	0.47
Quality measurement	2.00	5.00	3.27	0.82
Environment management	2.00	5.00	3.20	0.70
Quality improvement	2.00	4.00	3.18	0.50
Social benefits	2.00	4.00	3.09	0.60

Among the top five most important practices, *leadership* has the highest mean score of 4.74 and the standard deviations of 0.44. About 74 per cent of the respondents indicated that leadership is ‘very important’, 25.6 per cent ‘somewhat important’. The respondents perceived that leadership determines business strategies. It is the major factor affecting the successful implementation of a quality management program. The executive management must provide visible on-going commitment and all the resources for the organisation. Furthermore, the executive management must generate enthusiasm among employees, encourage and motivate them to take an active part in maintaining a stabilised workplace by establishing effective communication. The leader assigns responsibilities to different departments in the organisation, defines roles, and delegates authority to the right people in an appropriate way. Active leadership should also ensure that an appropriate management is arranged for accident prevention.

Customer focus has the second highest mean score with a value of 4.58 and a standard deviation of 0.49. 58 per cent of the respondents regarded customer focus as 'very important', and 41.9 per cent said 'somewhat important'. The respondents perceived that all seaport activities should aim to deliver good customer service and to provide more value added services to customers. There are different departments in the seaports responsible for meeting their customer's needs such as marketing, customer care and a helpdesk. In most of the seaports, there are hotlines or key account managers to obtain feedback from customers or to deal with problems that they might have when using the seaport's services. It is worthy to note that as perceived by managers of the major seaports, customer loyalty, based on the relationship between an organisation and its customers, is much more important than customer satisfaction. 'This again supported the findings in the studies of Ng (2006; 2009).

> *Loyal customers choose to keep using a service that's been provided to them from a certain organisation and not anybody else; whereas satisfied customers can choose to purchase a service from a competitor.*
>
> Marketing manager, seaport 15

Seaport managers also indicated that customer focus requires the seaports to have an attitude that can determine and satisfy customer needs. This attitude is reflected in adopting an effective problem resolution strategy and constantly seeking for service opportunities. To gain this, seaports should implement training programs of customer-focused service for all employees. The key elements of these programs are training on specific position responsibilities and organisational relationships, identification of the key processes within the business management system, compliance responsibilities, and competencies and knowledge that support the delivery of value-added services.

Technology has the third highest mean score of 4.25 with a standard deviation of 0.58. More than 32 per cent of the respondents answered 'very important', 60.5 per cent stated 'somewhat important', and only seven per cent said 'important'. All the surveyed seaports utilise information technology in management to enhance communication via either internal Lan network, or personal emails and websites for external contacts. Containerised seaports utilise electronic data interchange or seaport management software such as Navis or Tideworks to exchange information with ships. A few seaports operate their own enterprise resource planning and warehouse controlling systems. The seaport managers acknowledged that the importance of technology in maritime transport today cannot be understated. It plays a critically important role in ensuring maritime safety in busy seaports. A lack of technology systems such as the vessel traffic management system, terminal management system and other ubiquitous information and communication technology systems could potentially lead to seaport congestion and disruption.

> *If there is a major breakdown of these systems, there is a risk of maritime accidents: collisions or sinking of vessels in the middle of the channel. The consequence can be disastrous, from possible loss of life or injury to damage to properties and infrastructure such as ships, port facilities, bridges, etc. Commercial trade lanes can be shut down or disrupted.*
>
> Operation manager, seaport 17

The breakdown of the terminal management systems may cause dramatical risks given its importance in the day-to-day seaport operations and management. Terminal management systems incorporates multiple subsystems covering ship handling operations, quay transfer, yard and warehouse operations, gate operations, customer relationship management, finance. Moreover, the respondents stated that in the modern seaports which are joint venture seaports with international maritime

groups, terminal controlling management systems are also the information and communication technology platforms. They connect a seaport with other seaport users such as shipping lines, freight forwarders, truckers and cargo-owners. Therefore, any system breakdown in the terminal management system would likely lead to disruptive operations affecting the seaport and its users.

> *Many of the operations and administration carried out in seaports are either paper-based or reliant on proprietary systems. They could not be done without technology*.
>
> Technology manager, seaport 6

The fourth most important practice is *Safety management*. This practice has a mean score of 4.18 and the standard deviations of 0.58. Only about two per cent of the respondents indicated 'very important', 39.5 per cent 'somewhat important', 55.8 per cent answered 'important', and 2.3 per cent stated 'not very important'. Many seaports reported that they have obtained seaport safety operating licence, which requires compliance with stringent conditions to the safety of shipping and preservation of the marine environment. A large number of seaports reported having detailed occupational health and safety programs, which comply with legislations to facilitate and achieve the corporate safety culture. The respondents also reported that to maintain safe navigation for commercial shipping and administering the dangerous goods regulations, the seaports also have responsibility for emergency response to marine incidents environmental spills.

> *As part of our safety commitment, we undertake site specific safety courses for employees and partner. This will increase safety awareness within the ports because everyone has been aware of the risks and hazards that happend during conducting particular tasks.*
>
> Operating director, seaport 33

Communication and information is the fifth most important practices in a seaport as perceived by the respondents, which has a mean score of 4.04 and a standard deviation of 0.53. Approximately 28 per cent of the respondents considered it ‘very important’, 62.8 per cent ‘somewhat important’, and 9.3 per cent ‘important’. The respondents reported that one of the key communication enablers for seaports is radio communication. The use of radio frequency offers a bilateral two-way connection between a mobile computer, which is used to collect, display the data and can be portable or mounted onto a forklift truck. A host computer can be a separate computer hosted in a warehouse. The only way to meet today's demands, according to the respondents, is to have 100 per cent cargo flow control and traceability. Radio frequency encompasses all the elements of wireless communication required for real-time intermodal, logistics and manufacturing management. Information and communication is indeed critical to managing the large quantity of information on cargo flows.

Among five least important practices, the lowest mean score (3.09) and standard deviation (0.60) practice is s*ocial benefits*. Around 23 per cent of the respondents perceived it as ‘somewhat important’, 62.8 per cent ‘important’ and 14 per cent ‘not very important’. Companies show their appreciation for society by creating social events such as fund raising or providing assistance to local communities. However, seaport managers stated that providing jobs for local labours is the way a seaport contributes to ‘social benefits’. Consequently, the local communities should contribute more to the seaports in the future.

A practice with a mean score (3.18) slightly above the neutral point is *continuous improvement*, which has a standard deviation of 0.50. Twenty three per cent of the respondents answered that it is ‘somewhat important’, 72.1 per cent ‘important’

Some seaport managers (4.7 per cent) responded that this practice is already included in other practices or management policies of organisations. Quality of service therefore is directly or indirectly improved.

Environmental management has a mean score of 3.2 and a standard deviation of 0.70. Seven per cent of the respondents rated it 'very important', 16.3 per cent 'somewhat important', 67.4 per cent 'important' and 9.3 per cent 'not very important'. A big number of the respondents agreed that in the future this practice will be a big matter seaports should concern about. The operational productivity, the expanding and upgrading facilities at the moment are more concerned by the respondents than the social responsibility.

> *Even though protecting the environment is currently a hot issue, we have not given sufficient attention and care on it. It only becomes our concern when the local community requires or we have to comply with the commitments we have signed that are related to the environment.*
>
> Engineering director, seaport 31

Quality measurement has a mean score of 3.27 and a standard deviation of 0.82. Seven per cent of the respondents perceived this practice as 'very important', 30.2 per cent 'somewhat important', 46.5 per cent 'important' and 16.3 per cent 'not very important'. Many seaport managers perceived that the financial and operational measurements, for instance revenue, profit, ROI and handling productivity, are of greater concern than quality measurements. *People involvement* is considered important in the view of the respondents. An employer should rather seek to gain employees' co-operation and willingness than compliance. This requires employees directly to be involved in quality decision making. In relation to quality control, supervisory roles are mostly controlled by workers. Self-regulation

by workgroups leads to increased work ethics and self-development as well as removal of the need for strict supervision. Middle level of management needs to encourage participation of employees. Normally employers expect top-down communication via team briefings, and bottom-up communication for suggestions for quality improvement. However, employees are expected to be more independent and decisive when it comes to important decisions regarding their work environment. The respondents noted that the new initiatives had increased job satisfaction for employees because the jobs seemed to be more interesting even though employees have to work harder. Job security and safety were reported to have improved in many cases.

Three practices having the same mean score of 3.41 are s*ecurity management, supplier relationship and education and training.* More than four per cent of the respondents perceived *security management* 'very important', 32.6 per cent 'somewhat important' and 62.8 per cent 'important'. Seaport managers consider quality management important because it involves ISPS codes and safety at work, which relate to loading and unloading heavy cargoes, operating seaport handling equipment and facilities. Currently, quality and environmental issues are receiving an increasingly attention from the public and the maritime industries and these themes are often discussed in conferences or industrial meetings.

At the seaport, security refers to both the security of the network and the physical environment. Security of the network is vital and in a wireless environment, protection against unauthorised intruders is essential to ensuring that the physical area of the seaport remains unreached. As a seaport is an open, outdoor environment, to which many people have access, great care should be taken. Monitoring security throughout the seaport, screening the terminals, containers,

ships, trucks, rails cars, and personnel entering or leaving the facility should comply with International Maritime Organisation regulations. Seaports also need to communicate efficiently with coast guards, customs and police in regarding to security.

Although having a mean score of 3.41, *education and training* has a higher standard deviation at 0.66. More than four per cent of the respondents said it is 'very important', 37.2 per cent 'somewhat important', 53.5 per cent 'important' and 4.7 per cent 'not very important'. The scope of education covers customer and market awareness of employees and the importance of each individual's contribution to the quality of seaport service. Employees should undergo quality awareness courses, or attend small workshops as on-going team-works. This training is high value to employees.

Question B.6 asked about other key quality management practices contributing to the success of the seaports. Other factors such as subsidies from the government affect quality management. Vietnam is keeping up with globalisation, especially in the South Eastern Asian area and is applying international seaport treaties in different policy aspects, including quality management. Modern seaports should be competitive in terms of just in time and port tariff. Seaports should be integrated into the logistic or supply chains to be able to expand their activities. An efficient seaport needs not only equipment, superstructure, infrastructure, that can connects with other modes of transport, but motivated management, and qualified employees. In the past the public port was important but privatisation process in seaport operations and infrastructure makes them more competitive today. This is in line with the study of Ng and Tongzon (2010).

The answers to question B.7 '*how frequently a seaport uses external auditors for assessing quality management system and its benefits*' show that the seaports that have obtained their ISO certificates have regular assessment from external quality assessment organisations every two years. However, it appears that Vinalines' seaports have more regular assessments than other seaports; namely, assessments by external quality organisations and internal assessments by Vinalines. According to these seaports, the benefit of obtaining quality certificates is to assure the quality of the seaport's facilities and equipments and helps the seaports to do marketing for their services. Quality certificates somehow give these seaports a comparative advantage over other seaports.

The respondents were then asked whether the quality management system used in their seaports is appropriate. The majority perceived that since ISO was introduced, not only the seaport's throughput has increased but customer's confidence has also been increased. This was reflected from the feedback of importing and exporting companies, who have cargoes transported to countries like United States, Australia, or European countries. In an indirect way, an ISO certificate ensures that cargoes stored at seaports comply with international standards, especially concerning the requirements on safety and security. Implementing an ISO system means all processes and procedures are documented. The duties and obligations of the persons in charge for each process are assigned. The working process has become easier and better organised after implementing this system. When a technical fault occurs, it will be checked against based on quality management standards and resolved accordingly. Apart from prescribing the tasks for staff, back-up plans and emergency contacts (in case the person in charge is absent) are provided, thus the remedial process is quicker and more efficient. By applying ISO standards, the

relationship between staff at departmental or organisational levels improves significantly as a result of better collaboration and coordination at work. However, many respondents admitted that the current systems are not appropriate.

> *I cannot say this method is not appropriate but in fact it is in some cases inappropriate and the actual effect it brings is minimal. In my opinion, ISO only needs to be applied in key operations, for instance, cold or IMMDG cargo storage.*
>
> Managing director, seaport 2

Seaports which implement their own quality management and have their own self-assessment systems perceived external assessment as not being an appropriate approach. In their perceptions, obtaining external certificates constitutes a big waste in resources. A seaport has to regularly invest in upgrading to advanced equipment as required by ISO. This leads to financial waste. Besides, periodical external assessment consumes the time of the seaport's staff and managers.

> *As an interim assessment, we need to let external auditors assess our application of this certificate. This, in my opinion, is a waste of time and money. We even have to buy and install expensive devices in order to meet the requirements for one certificate. I think in fact, the quality of a seaport does not depend on an approved piece of paper, but should be achieved through practical daily improvement.*
>
> Manager, seaport 9

To maximise the benefits of quality management several seaport, managers showed interest in applying six-sigma after visiting seaports of developed countries (Seaport 6, 8 and 11).

In terms of changing management method (question B.9), seaport managers perceived that organisations should strengthen their collaboration with each other, especially those in the same maritime group or corporation. Member enterprises

should know the benefits from having associations. If there is no apparent connection between these organisations, they will undoubtedly lose their market share to competitors who are willing to lower prices to attract customers. The other change that should be made, according to the respondents, is to improve the infrastructure connections between seaports, rails and roads. Vietnam is known for having one of the worst traffic infrastructures in the region, which is well addressed in the study of Thai and Grewal (2005). Despite a vast amount of investment, traffic congestions still remain. If the traffic situation can be improved, total costs will dramatically decrease for all stakeholders involved.

In regarding to whether seaports should integrate into the supply chains and whether this will have a positive effect on the Vietnamese maritime culture (Question B.10), the respondents perceived that the national fleet carries only a small percentage (30 per cent) of the total import and export cargoes. The remaining 70 per cent of the import/export cargoes are carried by international shipping lines. A closer connection between Vietnamese importers, exporters and national shipping lines will be beneficial to Vietnamese organisations. Vietnam becomes important not only to Intra-Asian trade, but also to the international trade. Abig number of shipping lines is choosing Vietnamese seaports for their east-west trade routes. Meanwhile Vietnam's seaports are gradually changing from feeder services to direct services for both the Asia-US and Asia-Europe routes (JICA 2010; Vietnam Investment Review 2004).

5.5 Summary

Vietnamese Port Association seaports are the major seaports, which contribute 85-90 per cent to the total national seaport throughput. These seaports are varied in

sizes and ownership. The empirical test results reported that a high percentage (68 per cent) of Vietnamese seaports is currently implementing ISO 9001 quality management. However, the respondents perceived that ISO appears not suitable for seaports seeking for the long term sustainability. As indicated by the respondents, the biggest weaknesses for Vietnamese seaports are coordination, infrastructure connections, low productivity and inefficiencies in seaport operations. Seaports are seeking for other more suitable quality management systems. Under the pressure from competition and from the fast growing tradein the region and country, the seaports managers perceived that in the future seaports need to operate in supply chains and adopt a new approach for quality management, which enables seaports to collaborate effectively with other stakeholders in supply chains.

CHAPTER SIX

QUALITY MANAGEMENT FOR SEAPORTS IN SUPPY CHAINS

6.1 Introduction

Chapter Five discussed quality management currently being implemented in Vietnamese seaports. This chapter continues the discussion with the brodeader focus: internal and external focus for seaports in supply chains. The first section provides the general assessment on the most important practices perceived by the respondents. It then is followed by discussing in details how each practice and its attributes were perceived. The outcomes of this discussion answer the primary research question:

> *What quality management practices are apropriate for seaports as they become further integrated in supply chains?*

6.2 General assessment

As discussed in Chapter Three, the internal practices of the framework are derived from ISO and total quality management practices, while the external practices were selected from supply chain quality management, seaport integration factors and quality management in maritime logistics. Table 6.1 shows the importance of each practice of the framework as perceived by the respondents. It can be seen that the three most important practices based on the mean scores are customer focus, leadership and information technology with customer focus ranking first. From the seaport managers' point of view, maintaining the relationship with stakeholders is essential to keep the supply chains flow smooth and efficient. Stakeholders should be considered not as the seaport's partners but as customers, who contribute substantial benefits to the seaport and its supply chains. This is in line with the study of Robinson (2002). Following the customer focus practice in importance is the role of leadership, the influence of which expands when seaports embed further

in their supply chains. Seaport leadership has a broader vision, which covers all daily seaport activities (administrational, operational and financial) and the interactions with stakeholders. While interacting with stakeholders, information and technology becomes essential and is the backbone which links and facilitates all processes and minimises costs and uncertainties. Information and technology bring benefits to all stakeholders involved.

Table 6.1 Quality management practices for seaports in supply chains

	Min. Scale	Max. scale	Mean	SD
Customer focus	1.00	5.00	4.14	.83
Leadership	2.00	5.00	4.10	.80
Information and technology	2.00	5.00	3.90	.79
Human resource	2.00	5.00	3.66	.92
Education and training	1.00	5.00	3.66	.83
Quality integration	2.00	5.00	3.63	.83
Process management	1.00	5.00	3.62	.95
Quality performance	2.00	5.00	3.62	.77
Network optimisation	1.00	5.00	3.61	.95
Social benefits	1.00	5.00	3.45	.90
Continuous improvement	1.00	5.00	3.24	.79
Quality culture	1.00	5.00	3.22	.84
Valid N (listwise)				

The three less important practices are quality culture, continuous improvement and social benefits. A supply chain is a multinational and multicultural network and thus building a quality culture throughout the whole supply chain requires extensive effort and high consensus from each stakeholder. The respondents expressed that continuous improvement should always be a part of the seaport internal organisational policy regardless of whether quality management is implemented or not. When operating in the supply chains, seaports and their stakeholders need to focus on the practices that can make the supply chain move efficiently.

Table 6.1 also shows that in comparison to generic quality management practices (manufacturing and service organisations), internal practices appear to be less

important except the practice Customer focus, and external practices - quality integration, process management and network optimisation – are perceived more important. This may be in a large network, seaport managers probably realises that the success of a seaport will depend on the success of the whole supply chain. Seaport management now tend to focuse more on the movements of the supply chains rather than only of seaports. This confirms that seaport managers are more aware of development tendency of future seaports: integrate in supply chains.

6.3 Perceptions on the quality management framework

The following section elaborates on how each practice is perceived by seaport management. The perceptions on these practices might be different thus the comparison between the respondents with different working experience is provided.

6.3.1 Customer focus

It was found that in the quality management literature such as in the studies of Anderson *et al.* (1999), Claver and Molina (2003), Chan *et al.* (2002), Deming (1986), Hoang *et al*. (2006), ISO (2009), Jmenez and Costa (2009), Juran (1986), Sila and Ebrahimpour (2002), leadership is always considered as the most important practice. However, in the context of the supply chains, customer focus was ranked first by seaport management. All respondents perceived that customers are the first priority due to rapidly increasing business competition. As a part of a supply chain, a seaport needs to develop an effective customer service program, to entice customers to come back and patronise the seaport's and its supply chain's services. By understanding the current and future needs of the customers, seaports will be able to plan and operate accordingly. This is shown in the responses on e*xceeding customer and stakeholder expectations (*C1). Fifty six per cent of respondents

considered exceeding customer and stakeholder expectations as very important and 37.2 per cent considered it as important with a mean score of 4.48 (Appendix R, Section B).

> *I mean, for our customer demand…we should not only meet, but exceed them. In the future, seaports won't be able to surpass customer expectations by simply having a direct contact with their intermediate customers and suppliers. We need to focus on the end customers in the supply chains.*
>
> Engineering manager, seaport 20

The respondents suggested that using customer surveys, hotlines or e-desks to listen to the customers would be appropriate to develop customer relationships. Hotlines and e-desks will enable shippers, shipping lines, forwarders and other seaport users to send all transactions and information efficiently to seaport customer services. The advantages of using e-desks in Port of Antwerp and Port of Los Angeles were mentioned by the respondents after they visited these advanced seaports. According to the respondents, the e-desks can be used as a customer database depository for recording, updating and retrieving information related to each customer. When necessary, seaports can access information such as the history of customer transactions and their relationship with their suppliers. Maintaining a customer database will enable a seaport to understand more about its customers, their products, culture and market, enabling it to respond quickly to the changes in customer needs and requirements. The customer database also helps a seaport to accurately forecast and serve its customers in the way the customers prefer. This is reflected in the words of one of the respondents:

> *The market becomes complex and competitive. Customers become more knowledgeable. We should pay special care to customer relationship*

> *management, be flexible and process orientated. That hopefully, will secure a seaport's position in the supply chain networks.*
>
> Operating director, seaport 14

In relation to *employing a special channel for customer complaints* (C4), which has the second highest mean score of 4.25 and a 0.65 standard deviation (Appendix R, Section B), the respondents considered it important that in a global supply chain operation, products and services of seaports could be complex and diversified and seaports might face difficulties in capturing accurate feedbacks from all customers. Given this concern, seaports need to employ an appropriate channel to deal with customer complaints. This requires sophisticated equipment and competent staff experienced in customer relationship management. The majority of the respondents believed that a special channel for customer claims will be useful for seaports to quickly adapt to changes in the business environment.

> *We should be aware of how customers value our services. Customer complaints determine the strategic areas for us, which I mean, the seaports and the supply chains. More understanding about customer complaints and assessment will support us to secure a foothold in the market more effectively.*
>
> Manager, seaport 18

Although the respondents agreed that seaports should manage and minimise customer complaints because when a seaport has a high complaint rate, this means customer relationship management of that seaport is negative and problematic. However, some seaports consider customer complaints as valuable information for improving the quality of their services.

> *Instead of spending a lot of money on customer research, advertising and promotion programs, why do we not use our customer complaints as a realistic and cost effective tool to target the market? Customer*

> *complaints point out specific weaknesses and thus we know how and in which area we should improve.*
>
> Manager, seaport 28

From the perception of seaport managers complaints are opportunities for seaports to learn from and connect with customers. Even if complaint levels increase, it should be looked at in a positive light. For example, it indicates that the seaport has a good customer relationship management and a good channel for customer feedbacks, whereby seaport customers are able to communicate effectively and openly. No customer complaint does not mean, they are happy with the seaport services. In some cases, customers switch to using the services of competitors. Therefore, developing a dedicated channel is essential for seaports to listen to their customers.

More than 90 per cent of the respondents supported using *customer complaints and feedback for quality improvement*. Seaports should learn from mistakes and from customer complaints, because it is the quickest and most cost effective way for seaports to identify the problems. This is reflected in the words of the seaport managers.

> *A seaport should see customer satisfaction as a measurement for determining how well a seaport is accomplishing its mission and customer feedbacks provide valuable information into the core of the work of seaports*.
>
> Managing director, seaport 38

> *….customer complaints provide us valuable information about service failure, the organisation's weaknesses and thus guide us to how to best address the problems.*
>
> Manager, seaport 12

Ninety two per cent of the respondents supported that seaports need to *create value added services for customers* (this attribute has a mean score of 4.41 and a 0.69 of standard deviation). From the respondents' point of view, currently many seaports are offering value added services to customers. For seaports in supply chains, these activities are more important because they differentiate a good seaport and supply chain from another. Seaport managers stated that keeping customers loyal may require seaports to include value added services to their daily activities. One given example is custom clearance. The manager of seaport 5 explained that terminal operators could take care of custom clearance on behalf of their customers. This means the goods can leave the terminal without being cleared by customs. This service will save time and costs for customers and also clear potential bottlenecks for seaports. The respondents pointed out that expanding the land areas and activities makes it easier for seaports to provide value added services to seaport users. Only a small percentage of seaports (2.3 per cent) considered this attribute as not important because their seaports are located in a limited land area, making expansion difficult. Despite this, these seaport managers also thought that in future they should offer extra services to attract more customers.

When the respondents were asked about considering *the core stakeholder of a supply chain as the most important customer* (C5), 70 per cent of the respondents stated it is important. From seaport management point of view, the interests of the customers and the stakeholders may change as market fluctuates. It may be unrealistic to have to engage all stakeholders at the same level of intensity. The customer policy of seaports should be strategic and prioritised because it will save time and money for both seaports and customers.

> *The major customers or stakeholders may contribute from 70 to 80 per cent to seaport outputs. They are the key controllers who select the stakeholders to design a supply chain based on their market requirements. They also synchronise the activities between selected stakeholders. We had this experience during the time working for Nike shoes. It is important to give them priority.*
>
> Engineering manager, seaport 4

A small percentage (one quarter) of the respondents was neutral and did not support this. One respondent from a local seaport stated that as a service organisation, a seaport should serve customers on a 'first in first out' basis. He stated that any seaport users would be treated in the same way. This is understandable because small seaports or seaports having limited cargo sources are not always busy. They put in a lot of effort to attract and keep customers.

Table 6.2 The perception comparison on Customer focus practice

Customer focus	F	Sig.
C1	.222	.802
C2	.576	.567
C3	1.258	.295
C4	**7.026**	**.002**
C5	.808	.453

⇩

(I) Experiences		(J) Experiences	Mean score	Mean Difference (I-J)	Sig.
C4	1.00	2.00	3.75	-.79167*	.005
		3.00		-.25000	1.000
	2.00	1.00	4.54	.79167*	.005
		3.00		.54167*	.043
	3.00	1.00	4.00	.25000	1.000
		2.00		-.54167*	.043

Table 6.2 shows the different perception on '*employing a special channel for customer complaints'* (C4) between seaport managers with different working experience. The result indicates that group two considered this attribute very important (the average mean score was 4.5), while group one and three perceived it slightly important (the average mean score were 3.7 and 4 respectively). This might be that the managers of group two are directly responsible for daily seaport

activitities, directly in charge of customer complaints. Listening and satisfying customers are particularly essential from this group's view.

6.3.2 Leadership

The second highest important practice perceived by the respondents is leadership because leadership determines the success of an organisation. In the context of supply chains, the efficiency and effectiveness of a supply chain very much depends on the vision of the top management, their responsibilities, authority, and capability in allocating sufficient resources. The respondents indicated that *leadership involves and participates directly in quality decisions* (LD1), yielding a mean score of 4.5 and a standard deviation of 0.66 (Appendix R, Section B). The seaport managers categorised three types of quality involvement: strategy, tactic and daily operation. Strategic decisions relate to network design, development and location of seaport facilities and equipment, seaport tariff and handling charges, stakeholder relationship and marketing activities. Tactical decisions include equipment and distribution assignments, processes management and performance achievements. Operational decisions refer to daily operational activities. The respondents came to a consensus that to deliver good quality seaport services, the seaport leadership should be good in these three levels of decision-making. This requires the leaders to have management skill and expertise in seaport activities.

One interesting suggestion from the respondents is that seaports in future may need to assign a person as a supply chain leader, who has the knowledge and experience of supply chains. These supply chain leaders should be able to apply updated practices and systems to monitor seaport and supply chain activities.

> *From a supply chain perspective, the leadership should be competent in executing, improving processes and performance, defining and*

> *executing the strategy, policy and tactical daily activities. Probably I think the future seaport leadership should assign a person who is competent and able to deal with issues related to supply chain quality.*
>
> Managing director, seaport 2

Involvement of leadership in quality decision making means *allocating adequate resources for quality improvement* (LD3). Therefore, seaports need assure the availability of seaport infrastructure including berths, warehouses, terminals, equipment, systems (both hardware and software) and supporting services. This applies not only to 'hard' resources but also to 'soft' resources, for instance the ability to provide sufficient training and education and an enthusiastic working environment for employees.

Eighty per cent of the respondents considered *a clear quality collaboration policy with the stakeholders in the supply chain* (LD5) important. A clear partnership policy with stakeholders enables a seaport to collaborate successfully with key stakeholders, who take responsibilities and share the uncertainties and success of the products. A seaport should establish trustful and reliable relationships. The need collaboration inside and outside orhanisation needs to be in place to manage effective operations effectively and to reduce bullwhip effects. A close collaboration with stakeholders will reduce the risks for the seaports and the supply chain members. Working in a close collaboration allows a seaport and its stakeholders to utilise existing equipment and resources. It also enables the supply chain members to reduce the cost of operations and to explore opportunities for all members involved.

Similarly, the response with regard to *establishing a clear, reliable target in line with the needs and expectation of other stakeholders* (LD6) has a mean score of 3.86 with a standard deviation of 0.77. According to the respondents, customers

should be central in any service organisation. In the context of a seaport in the supply chain, seaport users or customers are also stakeholders. The demands from the market and supply chains can be unpredictable that may negatively influence seaports to achieve their performance objectives. In the future, seaports will need to develop market research and development activities more than they do currently. Only by understanding the customers, their future demand and expectations, seaports will be able to allocate sufficient resources in meeting these customer requirements. A small percentage of seaport management were concerned that each organisation has its own target and objectives, which make it difficult to satisfy the requirements of every stakeholder in the network chains. An example was given by the seaport manager 6.

> *Our target is to handle 35 per cent of the import, export and local cargo through this region. It may not be the same as the target of, says, a trucking company A. Here we have one seaport and about four trucking companies to pick up and deliver cargo.*
>
> Planning director, seaport 6

For leadership, the attribute *regularly reviewing quality issues in daily management meetings* (LD4) has the lowest mean score of 3.81. Fourty one per cent of the respondents had a neutral opinion. Although quality is important only half of the respondents supported this atribute. According to seaport managers', these meetings should review strategies, operational activities and fix the problems occurred during port operating processes. This is evident in one respondent's words:

> *Many things can happen in one day, we need to handle lots of things. Everything needs to be done quickly. If we could have sufficient time, we would review quality in every meeting, because quality, certainly, is important. We have assigned personnel and teams for quality matters. They will be in charge, it is not necessary to have a regular quality meeting.*

Operating director, seaport 13

Table 6.3 shows there were view differences on two attributes, *having long term commitment to quality* (LD2) and *allocating adequate resources for quality improvement* (LD3) between three groups of the respondents with different working experience. The results show that the significant difference was mainly from the views of group one and group two. For attribute LD2, group two (mean score of 4.3)

Table 6.3 The perception comparison on Leadership practice

Leadership	F	Sig.
LD1	1.053	.358
LD2	**3.929**	**.028**
LD3	**3.453**	**.041**
LD4	.480	.622
LD5	1.739	.189
LD6	.919	.407

⇩

	(I) Experience	(J) Experience	Mean score	Mean Difference (I-J)	Sig.
L2	1.00	2.00	3.62	-.75000*	.042
		3.00		-.28409	1.000
	2.00	1.00	4.37	.75000*	.042
		3.00		.46591	.242
	3.00	1.00	3.91	.28409	1.000
		2.00		-.46591	.242
L3	1.00	2.00	3.75	-.75000	.131
		3.00		-.06818	1.000
	2.00	1.00	4.50	.75000	.131
		3.00		.68182	.120
	3.00	1.00	3.81	.06818	1.000
		2.00		-.68182	.120

believed that a seaport should commit to provide the best quality to customers in the long run while group one (with mean of 3.62) hesitated that economic situation, high competition, economic downturns may be the obstacles for seaports to remain the same quality of services. As for LD3, the reason for the difference might be that group two (mean score of 4.5) is more directly involved in making resources availavle for seaport daily activities in comparing to group one (mean score of 3.7).

6.3.3 Information and technology

Seaport management recognised the influence and advantages of information technology on the seaport performanceand their daily operations. In the preliminary study, the respondents showed their interest by asking the researcher to emphasise this practice in the main study. According to the respondents, supply chains require smooth flow of traffic and transactions. Therefore *applying an effective information and high technology* (IT1) and *an ability to implement new information technology programs to facilitate seaport and supply chain activities* (IT5) are of strategic importance to seaports (Appendix R, Section B).

The respondents highlighted that many conflicts occur due to poor communication. Not being able to respond quickly to customer requirements and not allocating sufficient and advanced handling equipment may result in loosing their customers. Certainly, the application of an effective information technology system enables seaports to reduce conflicts and inaccuratetransactions and malfunctional operations. As a consequence, it will bring benefit to everybody in the supply chain.

The respondents shared that the current technology-linked activities within a company are not sufficient for seaports to operate in the global supply chains. Seaports ought to adopt the e-supply chain management systems that link processes of different organisations across geographically dispersed locations. These systems accelerate freight movements, shorten cycle time, reduce cost and respond better to market changes.

> *We may need to start thinking broader…about applying new information technology systems in improving freight movements. This is accelerating the progress to enable more professional and more seamless flows of the products along the supply chains.*

Engineering manager, seaport 31

About one quarter (25.6 per cent) of the respondents had a neutral opinion. According to them, applying effective (advanced) information technology will be costly and thus it is not the first priority in the strategies of these seaports.

Seaport managers expected to eliminate paper documentation in their operation and to use wireless communication technology for their future seaports. The answer to this expectation is to use standardised information and communication technologies and have a greater integration of technologies in daily seaport operation.

> *Modern organisations make their products different with others by technology and innovation ability. This will certainly impact on seaport operation and performance. Consequenly, it will impact on customer choice*

Engineering manager, seaport 22

The majority of the respondents supported *using a smart or automatic identification system to facilitate cargoes flows* (IT4). The respondents recommended auto identification systems, such as barcode, and wireless transmission devices with tags be attached to cargoes to identify their location and condition. These devices allow cargoes tracking and chasing. Using auto technology systems will reduce the waiting time of vehicles and cargoes and as a consequence, reduce bottlenecks. Moreover, automated system can store information and data can be retrieved anytime and anywhere leading to improved risk management.

> *It is vital to demonstrate the importance of understanding the global identification systems such as bar codes, electronic business messaging, data synchronisation or identification. They are becoming prominent in e-commerce and in understanding synchronisation of data, tracking and chasing cargoes.*

Managing director, seaport 25

The respondents raised concern about some seaports which may have sister seaports (such as Saigon and Singapore, Los Angeles) using different computing languages and radio frequencies. Thus, information stored in a tag attached to a container in one port may not be readable when this container is transported to another port. In future, the standards for frequencies and languages may need to be established for effective use of auto identification devices.

Eighty three per cent of the respondents considered an *effective usage of the enterprise resource planning systems* (IT2) as the backbone of a seaport's operation. To make the right and effective decisions, seaports and stakeholders need to apply enterprise resource planning systems. The respondents mentioned that enterprise resources planning should be applied for instances electronic data interchange, business intelligence systemson planning or warehouse management.

In relation to *using one intra-link system by all stakeholders to facilitate supply chain flows* (IT3*)*, the respondents agreed that without information sharing, tremendous inefficiencies may occur. Adopting one intra-link system with stakeholders may enable seaports to effectively exchange and access accurate and real-time information. Nevertheless, the respondents shared their concern that the enterprise resource planning system currently implemented by one supply stakeholder may not match those of the others. It will be very costly to reinstall or replace these systems. Another concern of the respondents is that some shared information might not be reliable and may create complexity and more uncertainties in the supply chain. If one company does not want to share, the linked system will not work.

> *I suppose using this information effectively may make the management of the supply chain more complex. More issues may have to be*

> *considered. Probably, not all information can be shared Basic information such as customer demand, product related, costs related and process related data can be shared.*
>
> Operating manager, seaport 17

Similarly, the respondents proposed that *sharing real time data with stakeholders* (IT6) should be considered at different levels from full to no information sharing dependent on the stakeholders' willingness to collaborate and build partnership by sharing information. Some business information should not be shared, for instance financial data, business strategies and tactics. The respondents explained that the more real time sharing of data with stakeholders, the more visible the processes of forecast, operation, and distribution.

Table 6.4 The perception comparison on Information and technology practice

Information and Technology	F	Sig.
IT1	.002	.998
IT2	.124	.884
IT3	1.838	.172
IT4	3.179	.052
IT5	.804	.455
IT6	2.441	.100

The results in Table 6.4 conclude that surveyed respondents with different years of working experience had consistent views on this practice.

6.3.4 Human resources

The seaport managers recognised the role of human resources in enhancing the quality of seaport services and performance. This is a valuable and irreplaceable asset as perceived by the respondents.

> *Products, time, money, information and people are valuable assets and resources for any business. Among them, in my opinion, people are probably most important and irreplaceable. If people are different, the business results will certainly be different.*
>
> Managing director, seaport 23

Over 40 per cent of the respondents considered *maximising employees'skill, knowledge and expertise (*HR3) as very important and 30.2 per cent as important. The reasons given by the respondents are that human resources are the core competence of the organisation. It reinforces business; achieve organisational objectives and performance expectations.

> *Implementation of management policies and initiatives rely heavily on human resources. Employees are the driver to make a business successful. It becomes an essential task for seaport leaders to develop a competent and skilful work team.*
>
> Operating manager, seaport 32

The strategies for human resources development shared by the respondents include (i) respect the right of individual employees, (ii) encourage and value the contribution of people to create more initiatives and benefits to seaports, (iii) create open and honest communication, and (iv) appraise and treat employees without discrimination for any reasons. One of the major tasks of seaports to maximise human resources skills and expertise is *creating an enjoyable, enthusiastic working environment for employees* (HR4). This leads to the result that employees think beyond their job scope and share their ideas openly. As a consequence, employees will be creative and able to contribute more to the success of the seaports. It is important for seaport management to have channels in place for employees to share their opinions. The respondents also noted that internal communication among employees, building a sharing and supporting culture should be included in human resources management policies.

> *We should learn the way how Japanese companies manage employees and encourage creativities through work … for example, suggestion boxes and brainstorming sessions. It is easier said than done …*
>
> Managing director, seaport 2

A good working environment also refers to assuring safety for everyone at work. It is understandable because workers at seaports are daily challenged with the handling heavy and dangerous cargoes, and accidents can happen anytime.

> *We should provide safety and health care at work and assure that each worker receives adequate safety and health training during the time they work in our seaport. A safe working environment provides peace of mind for the employees and the management.*
>
> Managing director, seaport 34

However, human resources could also be a great obstacle if it is not managed in a way that adequately addresses the issues. The average education level of the Vietnamese labour market is grade nine[4], which is low comparing to that of other countries in the region. Currently foreign direct investment increases remarkably and a big number of knowledgeable and competent workers are attracted to work for foreign organisations. This puts pressures on seaport management to create a good work environment to retain their experienced labour force in the seaports.

More than 70 per cent of the respondents confirmed the importance of *adopting a reward system to recognise the employees' quality efforts* (HR7). To encourage and maximise employee ability, the seaports might need to identify the key elements that affect employee satisfaction. These elements include compensation, reward, and incentive practices (for example monetary and non-monetary, formal, informal, group and individual) and recognition of the employees' contributions to the seaport

[4] The compulsory education system in Vietnam consists of 12 grades, where grade nine is in the Intermediate education level (Education database 2012 www.classbase.com/countries/vietnam/education-system)

performance. It is worth noting that human resource policies should be designed not only to reward for contributions but also to punish for misconduct.

Seaport management perceived *the seaport employees' commitment in providing error free outputs* (HR1) as important. The basic principle for developing human resources is to encourage individual employees to work better than required and to provide them career opportunities. The human resource or personnel departments should flexible human resource policies and assist employees through education and training. To assure quality for seaport services, employees need to commit in employment contract to be capable and responsible for their assigned duties. An example was given by the manager of seaport 8.

> *We are newly established. It is tough for us to compete with other seaports; our services, and quality have to be better. Our people should commit to not producing any faults or mistakes. If things go wrong, they have to be competent to fix them.*
>
> Technical manager, seaport 8

Enhancing cooperation among employees in the supply chain (HR6*)* has the lowest mean score of 3.09 in comparison with other attributes in this practice. Although the literature strongly supports that cooperation among employees in the supply chains should be enhanced, more than half of the seaport managers in this study perceived that it is important for seaports to achieve internal cooperation before getting the cooperation from other employees of supply chains.

The comparison between managers who have different working experience (Table 6.5) shows that there is a significant difference in perceiving attribute *Employee understanding of the value of the customers* (HR5) between group one and group two. The average mean score of 4.0 of group two (it is 3.1 in group one) indicates that customers are essential for seaports to provide the best services. It also found

Table 6.5 The perception comparison on Human resource practice

Human Resource	F	Sig.
HR1	.372	.692
HR2	.204	.816
HR3	3.394	**.043**
HR4	.705	.500
HR5	5.197	**.010**
HR6	2.077	.139
HR7	1.541	.227

⇩

(I) Experience		(J) Experience		Mean Difference (I-J)	Sig.
HR3	1.00	2.00	3.37	-.95833*	.040
		3.00		-.80682	.188
	2.00	1.00	4.33	.95833*	.040
		3.00		.15152	1.000
	3.00	1.00	4.18	.80682	.188
		2.00		-.15152	1.000
HR5	1.00	2.00	3.12	-.91667*	.009
		3.00		-.51136	.393
	2.00	1.00	4.02	.91667*	.009
		3.00		.40530	.380
	3.00	1.00	3.63	.51136	.393
		2.00		-.40530	.380

that there is a slight difference in the attribute *maximizing employees' skill, knowledge and expertise* (HR3) between these two groups. The higher mean score of group two has indicated that seaport managers with longer working experience may focus more on encouraging and developing employees' capability

6.3.5 Education and training

The average education attained by Vietnamese workers is very limited and thus pursuing education and study becomes a fashionable culture among the Vietnamese people and seaport management in particular. Education and training enhances staff knowledge and experience, enables the staff to perform their duties without errors. The responses to e*nsuring the competency of employees by providing frequent training and education* (ED3) have a mean score of 3.81. Over 37 per cent of the respondents claimed this attribute important and 27.9 per cent very important. Being a part of the supply chain is a challenge because seaports will be dealing with issues arising from *outsourcing and globalisation, which requires employees to be*

professionals. Employees are expected to understand their work, be able to determine work priorities and apply experience to achieve the organisational and supply chain goals. Some basic important knowledge and skills employees should know as suggested by the respondents are efficiency, productivity and risk management. Obtaining a foreign language skill (English and Chinese) becomes one of the basic competence requirements. Employees also need to understand their social and environmental impacts. In these cases, employees should attend relevant courses. Seaport managers also perceived that they need to inspire employees to work in learning, supporting and openly exchange information environment at work.

With regard to the atribute *training and education should be provided to everyone in the seaport* (ED1), the respondents were concerned that it may take time and costs to train staffs. Applying new technologies offers the possibility to take new approaches for training with low costs. According to seaport managers increasing the employee productivity and their competency by constant training while remaining the same working hours should be in a training policy. By applying new technology the employees can get trained without traveling. From the perspective of the employers, to avoid cutting back working hours, education and training can be delivered by online learning courses at work, while experiments can be done by visiting the stakeholders or industrial plants. The teleconference courses, according to the respondents, will play an important role in future learning. New supply chain knowledge or practices on daily operation will be delivered through teleconference workshops. E-learning increases the opportunity for everyone from top leaders to workers to update their knowledge.

Less than half of the respondents supported *using auditing reports, reports on, business performance and customer feedbacks for quality training purposes.* Auditing reports should be kept confidential. Customer feedbacks and some selected auditing reports can be used for educating and training employees.

The comparison between managers who has different working experience in Table 6.6 shows that there is no difference in perceiving the importance of this practice

Table 6.6 The perception comparison on Education and training practice

Education and training	F	Sig.
EDU1	2.011	.147
EDU2	.396	.675
EDU3	.008	.992
EDU4	.768	.471

6.3.6 Quality integration

This practice includes six attributes of which e*ffective and long-term collaboration and cooperation policy with stakeholders* (QI2) has a highest mean score of 3.79. Sixty five per cent of the respondents perceived this attribute important. The respondents indicated that currently many seaports are seeking cooperation with other organisations for outsourcing capabilities and sharing of resources. Seaport management also realised a number of benefits through long-term partnership collaboration and coordination. It was emphasised in the answers of two big seaports 2, 6, which belong to Vinalines.

> *Yes, collaboration… It brings lots (of benefits): efficient operations, smooth transactions, shared markets, even accurate forecast. It would be pleasant to work in close cooperation and collaboration. Unfortunately, currently this task is not up to the level it should be.*
>
> Managing director, seaport 2

The benefits of collaboration were given in more detail by the respondents. These benefits can be grouped into: increasing seaport throughputs, lowering costs and expenses, reducing response time to customer demands, improving service levels and customer satisfaction, and being flexible in doing business. Discussing the benefits in the supply chain context seaports may have, the respondents stated that it will increase visibility, meaning information visibility and give a status of orders and shipments.

To sharing long-term collaboration with stakeholders, seaport management pointed out several areas which future seaport policies should include. They are customer-oriented objectives, technological connectivity, a trustworthy relationship, integration and process design. The respondents provided more details, for instance, sharing knowledge and understanding, developing integrated cross-functional teams, raising commercial awareness about stakeholders, encouraging and promoting stakeholders who have the required capability to meet seaport requirements, committing to a long-term relationship, and striving for continuous performance improvement. To make collaboration more effective, seaports can provide some forms of collaboration such as strategic alliances, joint ventures, cooperative arrangements and virtual collaboration.

The respondents agreed that g*aining an accurate forecast by close coordination and collaboration with stakeholders* (QI5) is important. The reason is that a close collaboration may bring many benefits to the seaports and the supply chain members. However, a variety of processes and stakeholder tiers in a supply chain could lead to the bullwhip effect. An accurate forecast requires each member cooperating and providing accurate and reliable information on demand and inventory. This means, reliance only on the information given by supply chains

members could be insufficient for seaports to operate successfully in supply chains. Seaports need to develop the professional market research, an advanced customer database, SWOT analysis (strengths, weaknesses, opportunities and threats) and a close relationship with stakeholders to have an accurate demand forecast.

Nevertheless, the respondents indicated that collaboration should first develop within the organisation to create a more closely integrated internal operation. Only after this has been done seaports can extend their collaborative efforts to other stakeholders of supply chain.

> *We believe that effective external collaboration is associated with internal collaboration. Failing collaboration inside the organisation may be a result of a lack of coordination or communication among organisation departments and among individuals.*
>
> Managing director, seaport 18

The seaport managers were then asked whether seaports should *select stakeholders for the supply chain based on their quality of services and products* (QI1). The findings show that there were different opinions. Some seaports said that they were chosen by customers. These seaports are small and isolated. A tendency that should be addressed here is a seaport now will not work in isolation. Many are merging with either a maritime group or with their major stakeholders (for example, vegetable, steel and petroleum seaport). This helps seaports to be competitive in the market. Another stream of opinions is that, maybe for the long run, seaports and supply chains should commit to providing the same quality in every process of the supply chain. Nevertheless, seaports should assure the quality of their services rather than that of the others in the supply chains. Care should be taken when selecting the partners, who not only match with seaport needs and capabilities, but also have clear quality standards, metrics, goals and implementation procedures.

In terms of assisting the stakeholders in the supply chains by *providing technical, operational, commercial assistance* (QI3), the responses were varied (see Appendix R, Section B). Some seaports indicated that they were willing to assist stakeholders who are seaport direct customers (seaports 3). Other seaport managers (seaports 20, 27) indicated that depending on the specific assistances the stakeholders require, the seaports may consider this assistance.

> *Well, yes, we will but it depends on what the stakeholders want. If some assistance goes beyond our ability or obligation, then we can't assure. Should make sure that assistance is different to obligation, if you ask for more than we can offer, it will not gonna work.*
>
> Engineering manager, seaport 20

Similarly, the respondents showed that *adopting inter-organisational teamwork for quality assessment* (QI6) is not important. As the respondents indicated in the answers on the current quality management in seaports (see Chapter Five), quality assessment can be done by the mother organisation (shared holding organisations). At the same time each stakeholder may apply different quality management criteria or system, thus it would be hard to achieve an agreement on assessment from a inter-organisational teamwork.

Obtaining formal commitment of stakeholders to provide at least the same quality of services and products (QI4) was not supported by the respondents. This attribute has the lowest mean score which is 2.97 and a standard deviation of 0.70 (Appendix R, Section B). In the perception of seaport management, a formal commitment to provide the same quality all the time appears impossible. Firstly, this role might need to be taken by the supply chain masters (or controllers) who decide the quality level and requirements. Secondly, in the peak seasons, the seaports may not be able to arrange berths available in time due to busy traffics; they may have to outsource

some activities to intermediaries. In that case, quality may be not at the same level that the seaports used to provide to their customers and stakeholders. If a formal commitment is applied, it would be easily broken and this causes conflicts and delays in processes and transactions.

The comparison between seaport managers who has different working experience in Table 6.7 shows that there is no difference in perceiving the importance of this practice

Table 6.7 The perception comparison on Quality integration practice

Quality Integration	F	Sig.
QI1	.845	.437
QI2	.035	.966
QI3	1.083	.349
QI4	1.388	.261
QI5	.230	.795
QI6	2.706	.079

6.3.7 Process management

This practice has ten attributes, of which *readinesss and availability of seaport facilities and service* (M2*)* has the highest mean score of 4.39 and a standard deviation of 0.62. Ninety three per cent of the respondents supported this attribute. This attribute was suggested by the respondent to add into the second survey, because it determines the quality of the seaport service. Examples were given by the managers of seaports 4 and 10.

> *In peak season times, berthing arrangement becomes an issue for busy seaports because all berths are occupied by vessels while the other vessels have to wait in the zero anchorage area for berthing arrangement This costs the shipping lines and shipper's time and money*
>
> Engineering manager, seaport 4

> *Delays may lead to breaking import and export contracts, and as a consequence the seaports lose their customers. In terms of quality*

> *service, a good seaport will not have congestions or will manage congestions well.*
>
> Operating manager, seaport 10

In the respondents' perceptions, this task is related to market forecast, customer relationship, and planning. An accurate market forecast requires the seaports to have effective and reliable information sources, to understand the demand and supply of the market, the current existing, potential competitors and government policies. This also requires the seaports to have experienced and knowledgeable staffs. Once the market forecast is accurate, the seaports are able to allocate necessary resources to meet market demand. A close relationship with customers and stakeholders enables the seaports to acquire information for their future requirements. The respondents linked this attribute to the questions on the practice *customer focus* and emphasised again the importance of understanding the customers and their demand history (using the customer database).

The second important attribute as perceived by the respondents is an *ability to manage delays and congestions at seaports* (PM1), which has a mean score of 4.12 and a standard deviation of 0.68. 83.7 per cent of the respondents supported this atribute. A seaport with smooth traffic, no delays and congestions is an ideal target for every seaport. When congestion occurs, it consequently triggers a chain effect. For example, if a delay happens when cargoes are being discharged from a vessel, this will lead to congestion of the trucks waiting to pick up the cargoes to be moved to the terminals or storage. Terminal activities maybe need to be temporarily ceased due to waiting for the delayed cargoes. Then the delay will cascade to the next process. It is clear that due to delays and congestions, seaports will lose customers. As a result, annual targets and throughput will not be achieved. To be able to

manage, as the managers of seaport managers 5, 9 stated, the reasons leading to delays and congestions should first be identified. Once the reasons have been determined detailed action plans can be taken accordingly.

The respondents categorised congestions and delays into three groups. The first group is the daily traffic delays that happend when vehicle speeds are low that lead to a long vehicle queues wating to pick up cargoes. The second group is traffic delay by collisions, emergencies and vehicle breakdowns. These congestions happened will cause delays at off peak times will lead to substantial traffic backups. The third group is delays at infrastructure connections. All the respondents considered this issue is the biggest problem Vietnamese seaports are now facing. Seaport and hinterland congestions may be expected to affect seaport efficiency and even market share. Specifically, one seaport manager mentioned that the growth in the hinterland traffic and bad congestions in surrounding areas near by the seaport gateways cause obstacles and difficulties for the seaport's daily operation. This leads to a decreased market share of that seaport.

The question was expanded to ask about the *ability to manage risks and incidents* (PM 10). The answers to this have a slightly slower mean score of 3.88 and a 0.66 standard deviation. In the perception of the respondents, risks and incidents occurred in the supply chains would be varied. On the stakeholders' side, risks can be the delays or shortage, unavailability of materials, carrier breakdown or weather problems. They can also facilities or machine breakdown, power or water failure at the plants, warehouses and office buildings. These things can happen anytime. On the seaport side, failed communication because of computer, hardware or software problems and malfunction of equipment and seaport facilities lead to the inability to

operations. In the business environment, demand fluctuations, economic downturn, and governmental policy changes can be risks for seaports and supply chains.

Managing risks requires seaports having experienced leadership, competent staff, and adopting a good *contingency management system for unexpected events* (PM5). The respondents indicated that unexpected events can be caused by human or natural factors. Human factors could be prevented by updating knowledge of the workforce through education, standardised procedures, and processes, while natural factors could be managed by providing regular training and practices. Nevertheless, the respondents indicated that these contingency systems should be well documented. When the respondents were questioned about their detailed contingency systems, the key elements in the systems can be summarised as: (i) fostering a risk awareness culture in operation and also in decision making, (ii) asking people to take responsibility in managing risks within their work activities, (iii) employing dedicated staffs to protect the interests of the seaport's business from a risk perspective, (iv) identifying and assessing material business risks by the management regularly, (iv) implementing a comprehensive insurance programme.

The respondents were questioned whether *major supply chain flows and processes should be understood by the seaports to reduce all wastes* (PM4). The results show that 80 per cent of the respondents considered this attribute important. The mean score is quite high at 4.02 and the standard deviation was 0.77. It will be not good enough if seaports only know their activities. They need to understand well the processes and flows of the supply chain. The processes of the supply chain will be different to seaport processes. Examples were given by seaport managers about material handling in the supply chain. Materials are allocated to different processing centres. Big factories may have different working centres. In many cases the same

materials may be located in different working centres. Materials can be transported along different routes existing between processing centres to avoid high transition costs. In case if a sudden breakdown or overloading of machines occurs which may affect the efficiency of the production flow, supply chain stakeholders need to find the alternative routes which consequently may make the system more complex, time and costs consuming and more controls are required. Seaports need to understand these processes and be flexible in reducing the bottlenecks, allocating sufficient equipment and changing of operating sequences to meet the handling requirements.

In relation to *increasing responsiveness to demand changes* (PM7), *improvement program aiming to find time and cost losses in all processes* (PM3) has a mean overall score of 3.72. This is the ability of an organisation to adapt to the demand diversity or changes according to the respondents. A flexible system is important because it quickly responds to special service requirements, market changes and a variety of operating requirements. Increased responsiveness to the demand changes means enhanced good customer relationship management, market forecast, ability to allocate facilities and equipment. Seaports and stakeholders in supply chains can increase responsiveness by outsourcing, merging or joining in associations.

Two attributes have mean scores below the middle point. They are: *seaport processes, procedures and practices should be standardised* and s*hare knowledge about core business processes with stakeholders* (PM9). As seaports handle a variety of cargoes from different customers, *seaport processes, procedures and practices should be standardised* by documentation, which will make employees involved in these processes know what to do and how to respond to uncertainties. This also eliminates, minimises non-value-added steps (PM6) (see Appendix R, Section B). The findings show that supply chains involve varied organisations with

different functions and processes. Seaport activities and processes are basically loading, discharging, handling and storage that will not be the same as those in manufacturing or retail organisations. Thus, it would be difficult for seaports to implement a program to control time and cost losses for all supply chain processes. In some cases, a supply chain has a master player (supply chain controller) and this role should be taken up by the controller, not the seaport. It is also found that seaport management perceived that core business processes could be shared, but only to a small extent.

Table 6.8 The perception comparison on Process management practice

Process Management	**F**	**Sig.**
PM1	2.068	.140
PM2	4.565	**.016**
PM3	.080	.924
PM4	2.280	.115
PM5	.465	.631
PM6	4.090	**.024**
PM7	1.518	.232
PM8	1.887	.165
PM9	.598	.555
PM10	1.722	.192

⇩

(I) Experience		(J) Experience	Mean score	Mean Difference (I-J)	Sig.
PM2	1.00	2.00	3.87	-.70833*	.013
		3.00		-.48864	.226
	2.00	1.00	4.58	.70833*	.013
		3.00		.21970	.902
	3.00	1.00	4.36	.48864	.226
		2.00		-.21970	.902
PM6	1.00	2.00	1.87	-.75000	.079
		3.00		-1.03409*	.024
	2.00	1.00	2.62	.75000	.079
		3.00		-.28409	1.000
	3.00	1.00	2.90	1.03409*	.024
		2.00		.28409	1.000

The comparison in Table 6.8 shows that there was a difference in perceiving the attribute *availability and readiness of seaport facilities and services* (PM2) between seaport managers with different working experience. The average mean score of group two was 4.5; of group three was 4.3, while of group one was 3.8. This

attribute is related to the seaport sustainability, market and customer forecast, which are in the strategic level. Thus, that could be the reason why group one's view was different to group two and three, who are mostly in the top management position. Although there was difference in evaluating attribute *standardizing processes, procedures and practices* (PM6) between group one (with mean score of 1.8), group two (mean score of 2.62) and group three (with mean score of 2.9), this attribute was considered not important by all three groups.

6.3.8 Quality performance

From a seaport management views, performance measurements provide information for accurate decision making. Performance measurements are the tools to identify potential organisational strategies, analyse strength and weakness, diagnose internal and external problems, and analyse situations to solve problems. It assists in setting management strategies, and re-engineering business processes.

When a seaport integrates into a complex network, performance measurements go beyond the seaport's normal key performance indexes. Thus, *determining appropriate quality performance indexes in the context of supply chain*s (PF1) has the highest mean score of all at 3.84 and a standard deviation of 0.72. The majority of the respondents commented that seaport performances become multifaceted. They are not limited within internal seaport processes but external processes. Identifying important measurements at multiple levels is more important. Hence, determining and monitoring these performance indicators become a complex task, because this involves different management processes.

Basically, when a seaport works in a supply chain, the key performance indexes should cover efficiency (reduce time and bottlenecks), effectiveness, quality and

flexibility of a seaport and a supply chain. According to the responses, these key performance indexes should measure (i) financial flows (cost and inventory minimisation, sales and profit maximisation, increase return on investment), (ii) operational flows (efficiency, in time delivery), (iii) customer satisfaction, (iv) responsiveness to changing market changes, (v) improvement in sustainability.

Although determining the performance measurement indexes is a difficult and complex task for seaports, *achieving good key performance indexes* (PF5) is always a target of any seaport. This attribute has a mean score of 3.53 and a standard deviation of 0.66, with the support of 48.8 per cent of the respondents. From a seaport management point of view, even though a seaport is a part of a supply chain, it is still an independent financial body and therefore a seaport has to achieve its best performance indexes for its own success. Organisational success and customer satisfaction towards the seaport services are measured by performance indexes. Therefore, operational, financial, social contribution indexes should rank first in seaport policies and plans. These indexes need to be realistic and relevant, based on appropriate research on the market, the customers, the seaport's productivity and capability. For example, the target for the annual throughput of seaport 23 is to achieve 30 million tonnes, 16 per cent more in comparison to previous year.

Moreover, additional indexes such as relationship with stakeholders, lead time, transaction indexes need to be included. Several seaports reported that their relationship with other stakeholders is not firmly established due to the fact that they are not operating in a supply chain. Therefore these indexes are not necessarily appropriate as performance indicators for every seaport. However, in the long run

these quality performance indexes certainly should be applied on a greater scale to assure efficient flows of cargoes transported through the supply chains.

The respondents were then asked about usi*ng performance indexes to find time and cost losses in all the processes in the supply chain* (PF4). The results show that 46.5 per cent of the respondents perceived PF4 important, 9.5 per cent perceived very important and 30.2 per cent had no particular position. The respondents shared their opinions that this should be practical and applicable methods using statistical tools. However, as a supply chain involves different organisations, each organisation may need to use their own systems or tools to determine the time and cost losses in their segment. A single organisation will not be able to find losses in a whole supply chain; this only can be done if all organisations coordinate and collaborate tightly with each other. In this case, an intra-network plays a crucial role in information exchange. The intra-network is not only for information exchange but it can also retrieve the data stored in the network.

When the respondents were asked whether seaports and supply chain stakeholders should have *a team specialised in quality improvement* (PF3), the percentage of the respondents supporting this attribute is not high at 39.5 per cent, which is similar to the percentage of respondents indicating a neutral position. In the perceptions of the seaport managers, a committee or team for quality improvement requires staff or workers, and normally senior and competent staff, and thus this leads to a shortage of competent staffs in seaports. However seaport management did support for an occasional quality improvement working team. The respondents expressed that when risks or losses occur, it is very important to work together to fix the problems. In addition, the respondents agreed that it would be necessary to have a periodic quality assessment along the supply chains.

The comparison between seaport managers with different working experience (Table 6.9) shows that group one and three considered *using KPI indicators for seaport operations and management measurement* (PF2) slightly important (the average mean score were 3.8 and 3.1 respectively). Group two did not include this attribute in quality management for their future seaports in supply chains (the mean score was 2.9) probably because the respondents of group two mainly come from the middle management level, who directly measuring and providing performance indexes for each process in seaports. It could be hard to apply the supply chain KPIs for seaport activities in the view of this group.

Table 6.9 The perception comparison on Quality performance practice

Quality Performance	F	Sig.
PF1	.091	.913
PF2	5.179	**.010**
PF3	1.675	.200
PF4	.203	.817
PF5	.563	.574

⇩

	(I) Experience	(J) Experience	Mean scored	Mean Difference (I-J)	Sig.
PF2	1.00	2.00	3.87	.91667*	.008
		3.00		.69318	.116
	2.00	1.00	2.95	-.91667*	.008
		3.00		-.22348	1.000
	3.00	1.00	3.81	-.69318	.116
		2.00		.22348	1.000

6.3.9 Network optimisation

From seaport management point of views, the efficiency of supply chains can be achieved through the optimisation of processes and activities. More than half of the respondents (53.5 per cent) perceived d*esigning for an optimal and effective network* (NW1) important and 27.9 per cent perceived it very important. In the views of seaport management, supply chains are complex and involving different tiers of organisations. A structure of supply chains strongly affects to their

flexibility and responsiveness to the market changes. Network optimisation aims to get (i) the convenient location of storage warehouse and terminal that can minimise the costs and reduce the uncertainties, (ii) accessible network connectivity that is easy for customers and other transportation modes. (iii) availability of alternatives (pull systems). The respondents explained that network optimisation is to determine the optimal size of a supply chain and utilisation of all resources (distribution and storage) to respond to the market demand. In many cases seaports may need to reallocate their depots and warehouse or schedule their facilities and equipment.

The other attribute seaport management considered important for optimising network is *using paperless system to facilitate transactions* (NW4) with 79.1 per cent supported. The advantages of a paperless system as pointed out by the respondents are fast, systematically, confidential, easy to retrieve. Using this system enables seaports and supply chains to minimise the costs, uncertainties that often occur in manual paper works. However, seaports and supply chain stakeholders need train competent staff and install the web with high security protection. A good and reliable database of this system is also required because if the system goes wrong it leads to mass mistake. With the tendency of further integration in supply chains, the respondents forecasted that organisations will replace the current paper system by paperless one in very near future.

In relations to attribute *ability to use outsourcing intermediaries for unfamiliar parts* (NW2), more than 54 per cent of seaport managers considered it important. This is related to the adaptability of seaports to the market changes. A concern was found that at the same time seaports may be involved in different supply chains. The capability limitation of seaports may not handle many tasks at the same time. In this case to keep customers seaports need to outsource some activities to their

reliable intermediaries. This is especially true when seaports increasingly expand their activities and influence the efficiency of supply chains. It showed that although network optimisation is perceived important, the adaptability and flexibility to meet customer requirements appears more prioritised. In similar, the respondents supported that seaports should be able to *collaborate with the stakeholders in adjust redesigning process and products* (NW5). All this aimed to accommodate the market changes and reduce the complexity and bottlenecks occurring in different processes.

Probably this term 'reverse supply chains' in *Minimise the effects of reverse supply chains* (NW3) has the lowest mean score of 2.25 and standard deviations of 0.72, with 48.8 per cent of the respondents not supporting. After having the explanation, seaport management indicated that these effects should be minimised. The respondents perceived that it should become the responsibility of a dominant stakeholder, or of all stakeholders, not of a seaport. Because, reverse logistics were defined mainly as product returns, recycling, materials substitution, reuse of

Table 6.10 The perception comparison on Network optimisation practice

Network Optimisation	F	Sig.
NW1	**11.112**	**.000**
NW2	.416	.662
NW3	2.207	.123
NW4	.637	.535
NW5	.596	.556
NW6	.023	.977

⇩

	(I) Experience	(J) Experience	Mean scored	Mean Difference (I-J)	Sig.
NW1	1.00	2.00	3.37	-1.04167*	.000
		3.00		-.53409	.142
	2.00	1.00	4.41	1.04167*	.000
		3.00		.50758	.052
	3.00	1.00	3.90	.53409	.142
		2.00		-.50758	.052

materials, waste disposal remanufacturing. In this case, reverse supply chain management cannot be limited to a single seaport but encompass to all other supply chain stakeholders from raw material suppliers to the end customers.

Table 6.10 shows that there is a significant difference in perceiving *designing an optimal and effective network* (NW1) between group one and group two. The average mean score of group two was 4.4, of group one was 3.3. This could be supply chain is a complex and multiplayer network, *designing an optimal and effective network* goes beyond the scope of seaports, becomes the responsibility of all players in the supply chain. Therefore, seaport managers with less working experience who are in the middle level of decision making may not consider this attribute important for their long term development strategy.

6.3.10 Social benefits

Seaport safety draws the attention of seaport management. In response to employing an *effective policy on seaport safety*, 98 per cent of the respondents supported with a mean score of 4.32 and standard deviations of 0.52 (SB1). This shows keeping seaport safe becomes a big concern. The respondents stated that safety at work is one of key criteria in providing a good and enthusiastic working environment for the workers. Currently, the International Labour Organisation (ILO) of the UN advocates decent working conditions for workers around the world. The ILO's Occupational Safety and Health Convention details safe operating procedures in ports for handling (stacking and storage) various types of cargoes and handling operations along berths and throughout marine terminals. In response, seaports should have to develop and adopt operator safety plans, for instance (i) workplace

safety and health standards, (ii) a reporting system for on-the-job accidents and injuries, and (iii) inspectors to enforce workplace safety and health guidelines.

The attribute *Effective policy on environmental management* (SB4) has an overall mean score of 3.74 and a standard deviation of 0.69. Sixty per cent of the respondents perceived that it is important, 39.5 per cent had a neutral opinion. According to the respondents, seaports in future will be under increasing pressure to reduce pollution (air, noise and water), which means seaports have to become greener. In reality, the number of seaports worldwide requiring vessels to either cold iron or burn cleaner fuels while in seaport is expected to increase. Similarity requirements are imposed on seaport vehicles and mobile equipment to either burn cleaner fuels or use electricity. This aims to reduce carbon emissions, noise pollution, air pollutant emissions, liquid waste generated and solid waste generated. Many seaports around the world are granted ISO/PAS 28000. In the near future, seaport management reckoned that to be sustainable seaports may be required to implement an environmental system that covers current environmental considerations, sustainability, waste reduction, conservation and recycling. This is shown in the responses of the seaport managers.

> *We need to think ahead about adopting an environmental system. This system could identify and minimise our related environmental risks such as garbage, waste water discharge and gas emissions.*
>
> Managing director, seaport 18

> *The environment policy should report and improve environmental performances and more importantly to educate and train all our staff to take environmental commitments.*
>
> Operating manager, seaport 33

More than half of the respondents considered *responsibility for the regional community* (SB5*)* important with a mean score of 3.41 and a standard deviation of 0.66. Currently the seaports contribute greatly to the regional community, providing jobs and services. In future the seaports may develop tourism and other activities that will contribute more to the local community. There are two answer streams. For the medium and big size seaports, the employees normally came from the regions, where the seaports are located. Some seaports of a long history of development (hundreds of years for the Saigon and Haiphong ports) may have two or three generations of a family working at the same seaport. Thus, these seaports have a very close relationship with the local community due to this specific characteristic. The other stream is the local governmental seaports under the management and control of the local provincial committee. Currently, the Vietnamese government is encouraging the development of local economy. All decisions made for these seaports (for instance development, investment, expansion) are decided by the local government. The relationship with the local community becomes more important because the board of management of these seaports were appointed by the provincial committee. Therefore, retaining a good relationship with the local

Table 6.11 The perception comparison on Social benefits practice

Social Benefits	F	Sig.
SB1	.103	.902
SB2	1.297	.285
SB3	2.973	.063
SB4	3.231	.050
SB5	3.389	**.044**

⇩

(I) Experience		(J) Experience	Mean score	Mean Difference (I-J)	Sig.
SB5	1.00	2.00	3.12	-.37500	.212
		3.00		.03409	1.000
	2.00	1.00	3.50	.37500	.212
		3.00		.40909	.086
	3.00	1.00	3.09	-.03409	1.000
		2.00		-.40909	.086

community is crucial.

The ANOVA test in Table 6.11 shows that there was a slight difference in the attribute *responsibility for the regional community* (SB5) between group two (with mean score of 3.5) and group three (with mean score of 3.0). As discussed above the reason might come from the perceptions of the managers of seapports which provide jobs for a big number of a local people. In this case contributing to the regional community might not be a responsibility of seaports but the way that helps seaports to operate and stay sustainable.

6.3.11 Continuous improvement

This practice has six attributes, five of which was supported by the respondents. Although the mean scores of these attributes were not high, slightly above the medium point (from 3.10 to 3.55), the respondents agreed that seaports should have a continuous quality improvement program. This program needs to apply for all seaport activities, from seaport strategies, policies and plans to evaluating performances, risk and opportunity; or reviewing stakeholder and customer feedbacks. The respondents also supported using a self-assessment program, the key performance indicators to evaluate strength and weakness of seaports and supply chains.

Only *using reports from internal and external audits for quality improvement* (CI5*) which* had the lowest mean score of 2.67 and a standard deviation of 0.91 was not considered as important by seaports. Respondents assumed that the audit reports should be kept confidential due to many real organisational financial data, sensitive information, which should not be exposed. For quality improvement purpose the

other sources such as customer complains, misconducting records from daily seaport operations can be used.

Table 6.12 The perception comparison on Continuous improvement practice

Continuous Improvement	F	Sig.
CI1	.421	.659
CI2	2.593	.087
CI3	1.411	.256
CI4	1.014	.373
CI5	.436	.650
CI6	1.719	.192

The comparison between seaport managers with different working experience (Table 6.12) shows that there is no difference in perceiving the importance of Continuous Improvement practice.

6.3.12 Quality culture

This practice includes four attributes. Sixty eight per cent of the respondents stated that the attribute *seaports and stakeholders should build a trustworthy, reliable and sharing environment* (QC3) is important. *Trust, reliability and openness enhance the long-term relationship among the stakeholders.* There is a large number of upstream and downstream stakeholders is in supply chains, their relationships are related from each other and can be both the business-to-business and business-to-cooperation. Therefore, trust is perceivedas an important element in supply chain partnerships. The decisions can be made in an easier and faster and more accurate manner when trust exists.

The respondents noted that, trust very much depends on information sharing within stakeholders. In this connection, a seaport may need to obtain the agreements from the stakeholders to increase the trust level for fast and accurate data transfer. It will be beneficial for future forecast, which is important in any organisation. Building

trust requires time and demonstration of daily basic responsibility from each stakeholder.

> *We aim to build a honest and integral relationship with stakeholders. We see long-term relationship important in sharing risks and information, because through sharing we can deal with the problems as soon as they occur. That will help to minimise risks.*
>
> Managing director, seaport 27

In relation with the atribute *Seaports and stakeholders should build reliability and a good image for supply chains* (QC1), the respondents shared their opinions that, a good image could be shaped by many different factors, for instance, viewing people as the key to success, achieving commercial excellence, conducting all activities in an ethical and sustainable manner, establishing and sustaining effective relationships, effective costs and good performances. This would be a target for any successful supply chain. In fact, it is a complex task requiring each member in the supply chain to work diligently towards the common targets. Again collaboration, sharing and building trust, honesty and openness are the key elements to achieve this. The attribute *offering cost effective and better services than the competitors* was not accepted by the respondents as it has a mean score below the midpoint.

The comparison between seaport managers with different working experience in Table 6.13 shows that there is no difference in perceiving the importance of this practice.

Table 6.13 The perception comparison on Quality culture practice

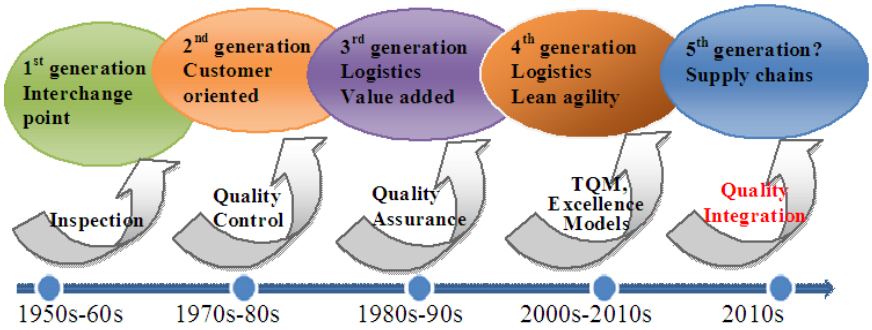
Quality Culture	F	Sig.
QC1	2.016	.147
QC2	2.049	.142
QC3	.038	.962
QC4	3.000	.061

6.4 Summary

This Chapter discussed the perceptions of respondents in relation to the proposed quality management framework. It was found that 12 proposed practices and 65 of 71 attributes were perceived important by respondents. It was worth noting that the role of information technology becomes essential. It facilitates material, financial and communication information flows, reduces the uncertainty, costs, and bring benefits to all stakeholders involved.

The other finding indicated that although the external practices are increasingly important, alternatively the internal ones appear less emphasised. This suggests that seaports are certainly more aware of being a part of global supply chains. Refer back to the evolution of quality management and seaports, quality integration could be relevant for seaports in their fifth generation (Figure 6.1)

Figure 6.1 Seaport and quality management evolution



CHAPTER SEVEN

CONCLUSION

7.1 Introduction

As addressed in Chapter One, the purpose of this thesis is to propose appropriate quality management practices for seaports integrated in supply chains. The discussions on quality management, seaports and supply chains have been discussed in Chapters Two and Chapter Three and provide the foundation for a quality management framework. Chapter Four discussed the methodology chosen to design and validate these proposed practices. The findings of the empirical study were discussed in Chapter Five toaddress the secondary research question and Chapter Six toanswer the primary research question. This conclusion Chapter readdresses the current concern that leads to conducting this study, summarises the major findings of the research, discusses its limitations and, proposes the potential areas for further research.

7.2 Purpose of the research

The rapid global economic growth has significantly changed the role and structure of seaports. Participating in supply chains appears to be an unavoidable tendency for seaports, which is increasingly evident in the literature (see the studies of Robinson 2002; Panayides 2006; Blumel 2008; Carbone and Martino 2003). Seaports are no longer an isolated organisation, but an important node in supply chains. When seeking an effective method that enables seaports to work successfully in supply chains, seaports, particular those in developing countries, tend to apply costly and time consuming methods. Examples of this include investing in new buildings and expanding terminals (Nguyen 2008), which do not significantly improve quality of seaport services. It has been argued that poor quality of seaport services is due to poor management (Ly 2009). This thesis used a

quality management approach to enhance quality and effectiveness of seaports in supply chains, in which quality management is not limited to seaports but goes beyond their boundaries and across to the other stakeholders in supply chains. More precisely, this study aimed to answer the primary research question: *what quality management practices are appropriate for seaports as they become further integrated in supply chains?* the secondary research question: *What quality management practices are currently being implemented in seaports?*

A combination of deductive and inductive reasoning and a two-stage methodology were employed in this study. An initial quality management framework was built based on the existing literature and the business reality that seaports worldwide are currently implementing total quality management and quality assurance ISO series. Thus these practices should remain for the internal dimension. The external dimension was derived from the selection of practices from logistics, supply chain quality management, and seaport integration factors, which facilitate supply chain interrelationship and its flows. To test the initial framework and explore the potential factors, a preliminary survey was conducted. The findings of the preliminary survey and updated literature were used to design the proposed quality management framework. The framework consists of 12 practices, of which eight are internal and four are external, were validated in the main survey.

7.3 Summary of findings

The proposed quality management framework was validated through two stages of surveys in Vietnam. Stage one applied a preliminary survey, in which the postal questionnaires were sent to 100 Vietnamese seaports from the list provided by the Ministry of Transportation of Vietnam. The response rate was 38 per cent. The

initial findings indicated that all 12 practices were perceived to be important by respondents. However, it was considered there were some areas that should be more deeply investigated, for instance, the role of information and technology, network optimisation, quality integration and quality culture. Stage two, as the main survey, employed telephone interviews to validate the proposed quality management framework. Forty-three members of the Vietnamese Port Association (VPA), which represents a 79 per cent response rate, participated in the main survey. The overall feedback from respondents indicated that this study is timely and worthy. The main study found: firstly, seaports are seeking the ways for long term sustainability to cope with the uncertainty of the business environment. Thus, an emphasis on quality management appears as one of the suitable choices for seaports. Secondly, since Vietnam became a World Trade Organisation member, seaports of this country became increasingly involved in global supply chains as result of significant growth in international trade through seaports. The Vietnamese government has urged seaports and related maritime organisations to become incorporated in supply chains. The respondents agreed that current investment spent on expanding terminals, building new seaports, upgrading seaport infrastructure and facilities, and other activities, is costly and time consuming.

In answering the secondary research question: *what quality management is being implemented in seaports?* the empirical results indicated that the implementation of quality management is important as it helps to improve the quality of service and seaport performance. Sixty-eight per cent of Vietnamese seaports currently are implementing quality management ISO 9001. Although some seaports reported using total quality management or their own quality management systems, these practices are quite similar to those practices in quality assurance ISO.

However, the respondents commented that ISO seemed to not be suitable for seaports for their long term sustainability. The reason pointed out by the respondents was that, the implementation of ISO is to get accreditation, which to some extent seems superficial, and it does not bring the true value of quality management. Quality management should be embedded in the organisational culture, in which everyone thinks, works and acts accordingly. Moreover, the new requirements from ISO have become a financial burden for many seaports. Therefore they are now seeking other quality management, for instance, some seaports attempted to adopt lean six-sigma quality. The current internally focused ISO was perceived by most respondents to be insufficient for seaports in the context of supply chains. Given seaports are a part of the large and multifunctional organisations, where their stakeholders are required to have effective relationships and collaboration for their mutual benefits, it can be expected that sooner or later the current ISO will be replaced according to the opinions of the respondents.

The findings also showed that the weakness of Vietnamese seaports was reflected in coordination and collaboration between seaports themselves and with the other modes of transportation. It can be seen more clearly between organisations of the same corporations or maritime groups. This directly leads to a loss of market share for competitors. The empirical study also found that the infrastructure connections in Vietnamese seaports were very poor and congested, which strongly affect the efficiency of cargo flows. Although this particular finding does not contribute to answering this study's research questions, it may be an area for a future research about Vietnamese seaports.

In relation to the primary research question: *what quality management practices are appropriate for seaports as they become further integrated in supply chains?,* the

proposed quality management framework consists of 12 proposed practices and 65 of 71 their attributes were accepted and perceived to be important by respondents.

It was emphasised that when interacting with stakeholders the role of information technology becomes essential. It facilitates material, financial and communication information flows, reduces the uncertainty, costs, and brings benefits to all stakeholders involved. The other finding indicated that although the external practices were perceived more important, alternatively the internal ones appear less emphasised. This suggests that seaports should be more integrated in global supply chains. It was found that the number of maritime groups, which cover seaport and other maritime and logistics activities, has increased. For seaport integration into supply chains, they may need to apply two levels. In the first level, seaport integration needs to be done with the stakeholders in the maritime segment and in the second level, expand it to the stakeholders in supply chains.

In relation to the internal practices, which are based on ISO and total quality management practices, include *leadership, customer focus, quality improvement, human resource, education and training, process management, continuous improvement, quality performance and social benefits;* the practice *customer focus* was been ranked the most important, and this was followed by *leadership* and *human resource*. The external practices include *network optimisation, quality integration, information and technology* and *quality culture.* These external practices were perceived to be increasingly important as seaports will be further embedded and integrated in supply chains. The complexity of supply chains requires seaports and their stakeholders to use one linked intra-network to share information and facilitate supply chain flows. A paperless system may be the future of supply chain transactions. Given the significant influence on the supply chains

efficiency seaports need to develop quality integration with their stakeholders through close collaboration and coordination, sharing benefits and risks. Thus, quality management for seaports in the fifth generation could be quality integration.

7.4 Contributions of this study

Through proposing a quality management framework, this thesis may enrich the literature in which quality management for seaports so far was only focused on internal organisational implementation. In particular, most studies use ISO or a total quality management approach for seaport quality management, which does not assure the quality for the whole supply chain. By incorporating inward and outward implementation, the proposed framework provides an additional discussion and views on what might constitute quality management for seaports to be successfully integrated in supply chains. There are a number of consistencies with earlier studies in the field, whilst also examining various quality management practices, each of which may need further exploration and to be empirically validated.

In relation to managerial implications, this thesis is timely and it may gain attention from Vietnamese seaport management on how to improve quality management, which may be one of the most economical ways to be sustainable, efficient and effective in supply chains.

In terms of research methodology, it was found that a two-stage data collection method was a useful approach. It can be recommended to researchers working in the new or unclear areas that have a little literature support. The first stage assists researchers to retest the existing theories (deductive reasoning) and yet at the same time determines the potential areas, where new applications, initiatives or gaps that have not been addressed in the literature. The outcomes of a first stage certainly are

very helpful in designing and conducting a second stage. This increases the reliability and validity of a whole study. Thus, the drawn conclusions of re-conceptualised, newly developed theories and frameworks could be more accurate based on the findings of the two stage surveys. Moreover, by undertaking a two-stage methodology the bias from sampling, instruments, or the survey procedure and process can be minimised and controlled. The other advantage of two stages of data collection is that it draws the attention of the respondents to the benefits of a study for their organisations and gives them sufficient time and information to provide insightful contributions to the study. It is actually a win-win approach for respondents and researchers.

Yet another finding to methodology is the use of telephone interviews as a legitimate means of collecting data from senior management. It was found that telephone interviews enable respondents to freely and accurately express their perceptions and in depth as two-way communication could occur during the interviewing that increases the reliability of the studies. The success of using telephone interviews is evidenced by the actual length of an interview being 43 minutes, which is much longer than the 30 minutes interview first allocated for respondents. In comparing the response rate of 38 per cent in the mail survey and 79 per cent in the telephone interviews, it appears that telephone interviews are also useful for achieving a higher response percentage. Moreover, with the current rapidly growing telecommunication industry, telephone interviewing is a legitimate means of collecting data from senior managers as it is convenient, flexible, confidential, easy to access, and cost effective.

7.5 Limitations of the research

This thesis would be insufficient without discussing its limitations. One particular limitation is that the proposed quality practices have been tested in seaports of a developing country. This may call into question about any generalisations from this study, as the confirmed practices and attributes may be relevant only in the Vietnamese context or for seaport systems in the second or third generation seaports. However, given the consistency of the findings of this study with other research, the findings of this study could at least provide guidance to subsequent research. The major attributes require greater focus and probing, including the attributes of the 12 practices. These practices may then be varied, added to or deducted depending on the development and characteristics of a seaport and the supply chain that it operates within.

A second limitation of this study is that its empirical test was validated at the seaports of the second and third generation. It is expected that a lack of attention and experience on quality management and on the supply chain integration certainly has impacted on the results of this study. Therefore the findings from the Vietnamese empirical test may not generalise for all seaports even-though the framework derived from the literature was developed to propose quality management for all seaports. While proposing quality management practices and suggestions from seaport management for seaports in supply chains the study has not provided the real constructive recommendations to implement them, thus it makes this study limited.

Another limitation could be choosing the right respondents. Only one top leader from each seaport was directly invited to participate in this study and therefore only a single view was provided. The result may be more reliable if multiple respondents

from each seaport were involved. Attempts at controlling bias in two stages of data collection of mail survey and telephone interview were given attention. However the high percentage of using Likert scales for the perceptual measurements in a questionnaire may have an effect on the quality and reliability of the data. Future studies might combine the perceptual measures with other methods or use more opened-end questions to investigate in depth interview contributions from respondents.

Although the preliminary study is recommended to use in business research, some concerns should be considered for the studies using similar questions to survey the pre-recruited samples or having a big time gap between stages. That may lead to potential learning effects as the perceptions on researched issue may change due to the circumstances. Applying adjustment methods, for instance, propensity score adjustment, member check, and triangulation are recommended for future researchers conducting a multi-stage survey.

Finally, in an attempt to propose a quality management framework, the thesis used respondent's perceptions to measure its practices as the main approach to collect data. Future studies might consider combining the perceptual measures with objective data.

7.6 Potential areas for future research

It is evident in the literature that there are several types of supply chain management, for instance traditional, proactive and world class. In the future, seaports as major contributors of national and regional economies will become involved in world class supply chains. If that is the case, supply chain relationships become very complex, the future research might consider the other quality

management frameworks of supply chain management. This means the thesis has not considered the complexity of supply chain relationships in different levels, which could leave a ground for further interest. Moreover while proposing quality management practices, this thesis also has not covered the regional integration that seaports may have while operating in supply chains, this may leave a room for a future research.

It was found that a seaport at the one time can be involved in several supply chains. Of interest is to what extent a seaport should integrate into one supply chain while still working in others. In other words, a question of how a seaport satisfies the requirements of all different supply chains seaports involved could be an area for further research. In addition, the dominance of an organisation has not been considered. It means with the increasingly expanded functions and activities, a seaport can be a focal organisation even having power over the other stakeholders of supply chains. Therefore this limitation could be of interest for further research.

Through this empirical study, it was clear that collaboration and coordination among organisations of the same maritime share-holding groups, for instance Vinalines, which have common objectives and interest was still very weak. The need for research in this area for preparing Vietnamese seaports in the future is urgent and strongly recommended. Moreover, improving connections and congestions at seaports is another suggested potential research area. The poor management of infrastructure connections lead to congestions at seaports and consequently, to the inefficiency of the freight movement and supply chains.

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LIST OF APPENDIXES

APPENDIX A. ISO PRACTICES

Practice 1: Customer focus:

Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations

Practice 2: Leadership

Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.

Practice 3: Involvement of people

People at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit.

Practice 4: Process approach

A desired result is achieved more efficiently when activities and related resources are managed as a process.

Practice 5: System approach to management

Identifying, understanding and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its objectives.

Practice 6: Continual improvement

Continual improvement of the organization's overall performance should be a permanent objective of the organization.

Practice 7: Factual approach to decision making

Effective decisions are based on the analysis of data and information

Practice 8: Mutually beneficial supplier relationships

An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value.

APPENDIX B. VIETNAMESE SEAPORTS – MOT LIST

1 Cảng Cẩm Phả
Đường Lý Thường Kiệt, P. Cửa Ông, TX. Cẩm Phả, Tỉnh Quảng Ninh
Tel: 033. 865045, Fax: 033. 865320

2 Cảng Dầu B12
Khu I, Bãi Cháy, TP. Hạ Long
Fax: 033. 847091

3 Cảng Khách Hòn Gai
Đường Lê Thánh Tông, P. Hòn Gai, TP. Hạ Long, Quang Ninh
Tel: 033. 628234, Fax: 033. 628473

4 Cảng Quảng Ninh
1 Cái Lân, P. Bãi Cháy, TP. Hạ Long, Tỉnh Quảng Ninh
Tel: 033. 825627, Fax: 033. 826118

5 Cảng Mũi Chùa
607 Lê Thánh Tông, TP. Hạ Long
Tel: 033. 740007, Fax: 33.828544

6 Cảng Caltex (Cty TNHH nhựa đường Caltex)
Xã Tam Hưng, Thủy Nguyên, TP. Hải Phòng
Tel: 031. 3875586

7 Cảng Chùa Vẽ
8A Trần Phú, TP. Hải Phòng
Tel: 031. 3766030, Fax: 031. 3765784

8 Cảng Chuyên dùng măng Nghi Sơn
Số 2 Ngô Quyền, Q. Ngô Quyền, TP. Hải Phòng
Tel: 031. 837391, Fax: 031. 837393

9 Cảng Hải Phòng
8A Trần Phú, Q. Ngô Quyền, TP. Hải Phòng
Tel: 031. 3859945, Fax: 031. 3859973

10 Cảng Đài Hải
70 Ngô Quyền, TP. Hải Phòng
Tel: 031. 3837483, Fax: 031. 3837485

11 Cảng Đoạn Xá
15 Ngô Quyền, P. Vạn Mỹ, Ngô Quyền, TP. Hải Phòng
Tel: 031. 3765029, Fax: 031. 3765727

12 Cảng Tatal Gas Hải Phòng
Phường Đông Hải, Q. Hải An, TP. Hải Phòng
Tel: 031. 3766545 - 031.3766535, Fax: 031.3766550 - 04.9741472

13 Cảng Thăng Long
Km 5,5, QL 5, Đường Hùng Vương, Hồng Bàng, TP. Hải Phòng
Tel: 031. 3749171, Fax: 031. 3749172

14 Cảng Thượng Lý
Số 1 Sở Dầu, P. Sở Dầu, Hồng Bàng, TP. Hải Phòng
Tel: 031.3850632, Fax: 031. 3850333

15 Cảng Transvina
280 Ngô Quyền, Vạn Mỹ, Hải Phòng
Tel: 031.3765252, Fax: 031.3765252

16 Cảng Vật Cách
Km9, QL5, Quán Toán, Hồng Bàng, TP. Hải Phòng
Tel: 031. 3850410 - 031. 3850321, Fax; 031. 3850319

17 Cảng Xăng dầu Petex Hải Phòng
Xã Đông Hải, Huyện An Hải, TP. Hải Phòng
Tel: 031. 3766224 - 031.3749171, Fax: 031. 3766085

18 Cảng Xi măng Chinfon
Thôn Tràng Kênh, Thị trấn Minh Đức, Thủy Nguyên, TP. Hải Phòng
Tel: 031. 3875480, Fax: 031. 3875458

19 Cảng Diêm Điền
Khu I, TT Diêm Điền, Huyện Thái Thụy, Thái Bình
Tel: 036. 732011 - 036. 853276, Fax: 036. 853276

20 Cảng Hải Thịnh
TT Thịnh Long, Hải Hậu, Nam Định
Tel: 0350. 876038

21 Cảng Thanh Hóa
Xã Quảng Hưng, TP. Thanh Hóa, Tỉnh Thanh Hóa
Tel: 037. 910062, Fax: 037. 910112

22 Cảng Tổng Hợp Nghi Sơn
Xã Nghi Sơn, Tĩnh Gia, Thanh Hóa
Tel: 037. 862237, Fax: 037. 862373

23 Cảng Bến Thủy
Số 10 Tràng Thi, Tp. Vinh
Tel: 038. 847144, Fax: 038. 847142

24 Cảng Dầu Hưng Hòa
Số 4 Nguyễn Sỹ Sách, Tp. Vinh
Tel: 038. 3846218, Fax: 038. 3597572

25 Cảng Dầu Nghi Hương
Số 4 Nguyễn Sỹ Sách, TP. Vinh
Tel: 038. 3830557, Fax: 038. 3845801

26 Cảng Nghệ Tĩnh
10 Tràng Thi, TP. Vinh, Tỉnh Nghệ An
Tel: 038. 847144, Fax: 038. 847142

27 Cảng Vũng Áng (Thuộc cảng Hà Tĩnh)
Xã Kỳ Lợi, Huyện Kỳ Anh, Tỉnh Hà Tĩnh
Tel: 039. 821541 - 039. 868006, Fax: 039. 821313 - 039. 868116

28 Cảng Xuân Hải
Thị Trấn Xuân Hải, Huyện Nghi Xuân, Tỉnh Hà Tĩnh
Tel: 039. 821541 - 039. 825027, Fax: 039. 821313 - 039. 825027

29 Cảng Hà Tĩnh
TX Gia Lách, Huyện Nghi Xuân, Tỉnh Hà Tĩnh
Tel: 039. 821544 - 039. 821541, Fax: 039. 821313

30 Cảng Cáng Gianh
Thôn Thanh Khê, xã Thanh Trạch, Huyện Bố Trạch, Tỉnh Quảng Bình
Tel: 052. 866017 - 052. 866297, Fax: 052. 866133

31 Cảng Nhật Lệ (Phân cảng Nhật Lệ)
P. Đồng Mỹ, TX. Đồng Hới, Tỉnh Quảng Bình
Tel: 052. 824359, Fax: 052. 823599

32 Cảng Quảng Bình
Thôn Thanh Khê, Xã Thanh Trạch, huyện Bố Trạch, Tỉnh Quảng Bình
Tel: 052. 866133

33 Cảng Xăng dầu Sông Gianh
Bắc Trạch, Bố Trạch, Quảng Bình

Tel: 052. 866230

34 Cảng Cửa Việt
Xã Gio Hải, Huyện Gio Linh, Tỉnh Quảng Trị
Tel: 053. 857363, Fax: 053. 824280

35 Cảng Chân Mây
14 Lê Lợi, TP. Huế
Tel: 054. 820449, Fax: 054. 833577

36 Cảng Thuận An
TT. Thuận An, Huyện Phú Vang, Tỉnh Thừa Thiên Huế
Tel: 054. 866037, Fax: 054. 866164

37 Cảng Hải Sơn
96 Yết Kiêu, P. Thọ Quang, Q. Sơn Trà, TP. Đà Nẵng
Tel: 0511. 831100 - 0511. 831623, Fax: 0511. 831520

38 Cảng Liên Chiểu
Kim Liên, Hòa Hiệp, Liên Chiểu, Đà Nẵng
Tel: 0511. 770211, Fax: 0511. 770211

39 Cảng Mỹ Khê (thuộc Cty xăng dầu khu vực 5)
1 Lê Quý Đôn, Q. Hải Châu, TP. Đà Nẵng
Tel: 0511. 821632 - 0511. 824585, Fax: 0511. 822874

40 Cảng Nại Hiên (thuộc Cty xăng dầu khu vực 5)
1 Lê Quý Đôn, Q. Hải Châu, TP. Đà Nẵng
Tel: 0511. 821632 - 0511. 824585, Fax: 0511. 822874

41 Cảng Đà Nẵng
26 Bạch Đằng, TP. Đà Nẵng
Tel: 0511. 835675 - 0511. 822513, Fax: 0511. 822565

42 Cảng Đà Nẵng (Khu Sông Hàn)
26 Bạch Đằng, Đà Nẵng
Tel: 0511. 822513 - 0511. 835675, Fax: 0511. 822565

43 Cảng Đà Nẵng (Khu Tiên Sa)
26 Bạch Đằng, Đà Nẵng
Tel: 0511. 822513 - 0511. 835675, Fax: 0511. 822565

44 Cảng Nguyễn Văn Trỗi
Đường 2/9, TP. Đà Nẵng
Tel: 0511. 639106 - 0511. 626313 - 0511. 626318, Fax: 0511. 623755

45 Cảng Sông Hàn 9
156 Bạch Đằng, TP. Đà Nẵng
Tel: 0511. 822977 - 0511. 826718, Fax: 0511. 834796

46 Cảng Xi măng Hải Vân(Cty xi măng Hải Sơn)
65 Nguyễn Văn Cừ, Đà Nẵng
Tel: 0511. 842172, Fax: 0511. 842441

47 Cảng Kỳ Hà
Xã Tam Quan, Huyện Núi Thành, Quảng Nam
Tel: 0510. 871305 - 0510. 871308, Fax: 0510. 871301

48 Cảng Kỳ Hà - Quảng Nam
Thôn 2, xã Tam Quang, Huyện Núi Thành, Quảng Nam
Tel: 510.872787, Fax: 0510. 872787

49 Cảng Dung Quất
208 Hùng Vương, TX Quảng Ngãi, Tỉnh Quảng Ngãi
Tel: 055. 610432 - 055. 610472, Fax: 055. 610431

50 Cảng Sa Kỳ

Xã Bình Châu, Bình Sơn, Tỉnh Quảng Ngãi
Tel: 055.626431, Fax: 055.626138

51 Cảng Quy Nhơn
2 Phan Chu Trinh, TP. Quy Nhơn, Tỉnh Bình Định
Tel: 056. 892363 - 056. 892159, Fax: 056. 891783

52 Cảng Thị Nại
Số 2 Trần Hưng Đạo, TP. Quy Nhơn, Tỉnh Bình Định
Tel: 056. 892991, Fax: 056. 892097

53 Cảng xăng dầu Vũng Rô
33 Lê Thánh Tông, Thị Xã Tuy Hòa, Tỉnh Phú Yên
Tel: 057. 823246, Fax: 057.523315

54 Cảng Ba Ngòi
9 Nguyễn Trọng Kỷ, P. Cam Linh, TX. Cam Ranh, Tỉnh Khánh Hòa
Tel: 058. 854307 - 058. 854565, Fax: 058. 854536

55 Cảng Dầu Mũi Chụt
10B Nguyễn Thiện Thuật, Nha Trang, Khánh Hòa
Tel: 058. 822651 - 058. 822173

56 Cảng Hòn Khói
108 Đường 2/4, Nha Trang, Khánh Hòa

57 Cảng Đầm Môn
248 Thống Nhất, Nha Trang
Tel: 058. 821283, Fax: 058. 823846

58 Cảng Nha Trang
5 Trần Phú, P. Vĩnh Nguyên, TP. Nha Trang, Tỉnh Khánh Hòa
Tel: 058. 590867 - 058. 590021 - 058. 590022, Fax: 058. 590017

59 Cảng Dầu K2
907 đường 30/4, Phường 11, TP. Vũng Tàu
Tel: 064. 848691 - 064. 848420, Fax: 064. 832195

60 Cảng Dầu nhà máy Điện Phú 2-1
TT Phú Mỹ, Huyện Tân Thành, Tỉnh Bà Rịa - Vũng Tàu
Fax: 064. 876964

61 Cảng Dầu PTSC
54 đường 30/4, P. Thắng Nhất, TP. Vũng Tàu
Tel: 064. 832636, Fax: 064. 838997

62 Cảng Hạ Lưu PTSC
65 đường 30/4, P. Thắng Nhất, TP. Vũng Tàu
Tel: 064. 838504, Fax: 064. 838313

63 Cảng Phú Mỹ
Phường Phú Mỹ, Q. Tân Thành, Tỉnh Bà Rịa - Vũng Tàu
Tel: 064. 876603 - 064. 876604, Fax: 064. 876600

64 Cảng Thượng Lưu PTSC
65A đường 30/4, P. Thắng Nhất, TP. Vũng Tàu
Tel: 064. 838105 - 064. 838104, Fax: 064. 838344

65 Cảng Vietsopetro
150 Lê Lợi, Tp. Vũng Tàu
Tel: 064. 839871, Fax: 064. 838655

66 Thương Cảng Vũng Tàu
973 Đường 30/4, P11, TP. Vũng Tàu
Tel: 064. 848312 - 064. 848544, Fax: 064. 848193

67 Cảng VIKO WOCHIMEX

Xã Phước Khánh, Nhơn Trạch, Đồng Nai

68 Cảng Gas PVC Phước Thái
KCN Gò Dầu, Long Thành, Đồng Nai

69 Cảng Gò Dầu A
Phường Long Bình Tân, TP. Biên Hòa, Tỉnh Đồng Nai
Fax: 061. 831259

70 Cảng Gò Dầu B
Phường Long Bình Tân, TP. Biên Hòa, Tỉnh Đồng Nai
Fax: 061. 831259

71 Cảng Long Thành
Phước Thái, Long Thành, Đồng Nai
Tel: 061. 841188, Fax: 061. 841207

72 Cảng Đồng Nai
Phường Long Bình Tân, TP. Biên Hòa, Tỉnh Đồng Nai
Tel: 061. 832225 - 061. 834139, Fax: 061. 831259

73 Cảng Phước Thái (VEDAN)
Phước Thái, Long Thành, Đồng Nai

74 Cảng Phú Đông
Xã Phú Đông, Nhơn Trạch, Đồng Nai
Fax: 08. 8728383

75 Cảng Bến Nghé
Đường Bến Nghé, P. Tân Thuận Đông, Quận 7, TP. Hồ Chí Minh
Tel: 08. 8723317, Fax: 08.8726499

76 Cảng Cát Lái
25 Nguyễn Thị Định, P. Cát Lái, Q2, TP. Hồ Chí Minh
Tel: 08. 8976394 - 08. 7421190

77 Cảng Dầu thực vật Nhà Bè (NAVIOIL)
58 nguyễn Bỉnh Khiêm, Q1, TP, Hồ Chí Minh
Tel: 08. 9102180, Fax: 08. 8290586

78 Cảng ELF Gas Sài Gòn
Khu phố 5, P. Tân Thuận Đông, Q7, TP. Hồ Chí Minh
Tel: 08. 8720407, Fax: 08. 8720406

79 Cảng Lotus (Cty Liên Doanh Bông Sen)
1A Nguyễn Văn Qùy, P. Phú Thuận, Quận 7, TP. Hồ Chí Minh
Tel: 08. 8730147 - 08. 8730148, Fax: 08. 8730145

80 Cảng Rau Quả
1 Nguyễn Văn Qùy, P. Phú Thuận, Quận 7, TP. Hồ Chí Minh
Tel: 08. 8730095, Fax: 08. 8733342

81 Cảng Sài Gòn
3 Nguyễn Tất Thành, Quận 4, TP. Hồ Chí Minh
Tel: 08. 9401030 - 08. 8254362, Fax: 08. 8263092 - 08. 9400168

82 Cảng Tân Thuận Đông
Phường Tân Thuận Đông, Quận 7, TP. Hồ Chí Minh
Tel: 08.8726221 - 08.8721873, Fax: 08. 872519

83 Cảng VICT
Đường A5, Khu Phố 5, P. Tân Thuận Đông, Quận 7, TP. Hồ Chí Minh
Tel: 08. 8729999, Fax: 08. 8724888

84 Cảng VITAICO
Đường Lê Phụng Hiểu, P. Cát Lái, Q2, TP. Hồ Chí Minh
Tel: 08. 8976050 - 08. 8976049, Fax: 08. 8976185

85 Cảng Xăng Dầu Cát Lái
Phường Cát Lái, Q2, TP. Hồ Chí Minh
Tel: 08. 8976046 - 08. 8976423, Fax: 08. 8976045

86 Cảng Xăng Dầu Nhà Bè
TT. Nhà Bè, Huyện Nhà Bè, TP. Hồ Chí Minh
Tel: 08. 8738587 - 08. 8738588, Fax: 08. 8738580

87 Cty tư vấn thiết kế Cảng kỹ thuật biển
92 Nam Kỳ Khởi Nghĩa, Q.1, Tp. HCM
Tel: 8.8211486, Fax: 8.8216274

88 Sài Gòn Petro
Phường Thạnh Mỹ Lợi, Q2, TP. Hồ Chí Minh
Tel: 08. 9307991 - 08.9307037/215, Fax: 08. 8994388 - 08.8991314

89 Tân Cảng Sài Gòn
Đường Điện Biên Phủ, P22, Quận Bình Thạnh, TP. Hồ Chí Minh
Tel: 08. 8999034 - 08. 8980379, Fax: 08. 8994388 - 08.8991314

90 Cảng Mỹ Tho
Xã Bình Đức, Huyện Châu Thành, Tỉnh Tiền Giang
Tel: 073. 853048, Fax: 073. 853049

91 Cảng Vĩnh Long
170/2 Phạm Hùng, P.9, TX. Vĩnh Long, Tỉnh Vĩnh Long
Tel: 070. 822635 - 070. 826124, Fax: 070. 825291

92 Cảng Cần Thơ
27 Lê Hồng Phong, Phường Trà Nóc, TP. Cần Thơ
Tel: 071. 841252, Fax: 071. 841247

93 Cảng Phúc Thành
Xã Phước Thời, Huyện Ô Môn, Cần Thơ
Tel: 071. 862804, Fax: 071. 860214

94 Cảng Tatal Gas Cần Thơ
Lê Hồng Phong, P. Trà Nóc, TP. Cần Thơ
Tel: 074. 883154, Fax: 071. 883172

95 Cảng Trà Nóc - Cần Thơ
Lô 18 KCN Trà Nóc, TP. Cần Thơ
Tel: 071. 841328, Fax: 071. 841457

96 Cảng Đồng Tháp
Phường 11, Thị Xã Cao Lãnh Tỉnh Đồng Tháp
Tel: 067. 891321, Fax: 067. 891121

97 Cảng Năm Căn
TT. Năm Can, Ngọc Hiển, Cà Mau
Tel: 0780. 877200, Fax: 0780. 878163

98 Cảng Mỹ Thới
Quốc lộ 91, P. Mỹ Thạnh, TP. Long Xuyên, Tỉnh An Giang
Tel: 076. 831447, Fax: 076. 831129

99 Cảng Bến Đầm - Côn Đảo (Vũng Tàu)
1007/36 Đường 30/4, P11, TP. Vũng Tàu
Tel: 064. 621047 - 064. 830010, Fax: 064. 621047

100 Cảng Hòn Chông
Rạch giá, Kiên Giang
Tel: 077. 854315, Fax: 077. 854648

APPENDIX C. PRETESTING LETTER - STAGE ONE

Dear Mr/Mrs.

Reference: Invitation on Pretesting second stage survey

I would like to invite you to participate in this pretesting of my data collection documents. This is the first stage survey of my PhD study on quality management in seaports integrated in supply chains, which is employed a mail survey to be sent to Vietnamese seaports. Your comments will significantly assist in improving the quality of the survey and response rate.

The purpose is to reconceptualise quality management practices for seaports, which have been addressed in the literature and investigate the new, potential issues, practices that could be used for the proposed model to be validated in the second stage. The research questions for this study are:

PRQ: *What quality management practices are suitable for Vietnamese seaports integrated in supply chains?*

SRQ1: *What quality management practices are currently being implemented in Vietnamese seaports?*

The process of the survey

1. An advance letter and response cards will be sent to all Vietnamese seaports listed in the website of Ministry of Transportation of Vietnam. One mail with attached questionnaire, advance letter will be translated into Vietnamese and pretested by bilingual researchers The replied mails will be collected after six weeks, which is considered sufficient and active time for responses, after sending.
2. After collecting responded mails, the questionnaire will be checked for errors then translated into English for data analysis.

The pretesting

Please consider the attached list of suggested questions when pretesting the following documents.

1. The survey questionnaire consists of three parts. Part A enquires into the background information of the participant. Part B focuses on the seaport's generation and its current quality management. Part C tests the perceptions on the guiding quality management practices adopted by seaports in supply chains.
2. The advance letter

It would be very much appreciated if any suggestions could be returned by 1st July 2010.

Once again thank you for your time and contribution to improving the survey documents.

Tran Thanh Hai

Research student

Department of Maritime and Logistics Management

APPENDIX D. ADVANCE LETTER - STAGE ONE

Locked Bag 1397
Launceston Tasmania 7250 Australia
Phone + 61 3 6324 9648 Fax + 61 3 6324 9720
Email; Tranth@amc.edu.au
www.amc.edu.au

Date
Title: 'First name' 'Last name'
Company:
Address City Country
Dear *'Title' 'Last name'*

Subject: Study on quality management for Vietnamese seaports in supply chains

We would like to invite you to participate in the study 'Quality management for Vietnamese in supply chains' conducted by Australian Maritime College. All Vietnamese seaport seniors are kindly invited to participate in this study.

Improving quality is currently being one of the biggest issues drawing attention from Vietnamese seaports; especially Vietnam is becoming more and more integrated in the global economy. To be sustainable and competitive, Vietnamese seaports may need to reform and change the way of management toward working in supply chains. Based on the studies on advanced worldwide seaports the purpose of this study is to propose quality management practices for Vietnamese seaports in supply chains.

This appears the first study on quality management for Vietnamese seaports; we hope the findings of this study will enable a seaport to select the most suitable quality management for it to enhance its service quality. A summary report of the results of this study is available to all participants upon request.

Your participation and contribution are very valuable to the success of this study. This study has been approved by the Tasmanian Social Science Human Research Ethics Committee (human.ethics@utas.edu.au) and any information related to this study given by you will be confidential. Should you have any questions or queries about this study, please contact Tran Thanh Hai either by telephone number: +61 3 6324 9648 or email: Tranth@amc.edu.au, or Dr Stephen Cahoon at email: S.Cahoon@amc.edu.au.

Yours sincerely,

Dr. Stephen Cahoon — Tran Thanh Hai

Head, Department of Maritime and Logistics Management — Researcher

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THƯ MỜI THAM GIA NGHIÊN CỨU KHẢO SÁT
QUẢN LÝ CHẤT LƯỢNG TẠI CẢNG BIỂN VIỆT NAM

Kính thưa Ông,

Chúng tôi trân trọng kính mời Ông tham gia nghiên cứu khảo sát " Quản lý chất lượng tại hệ thống cảng biển Việt nam' do trường Australian Maritime College – University of Tasmania thực hiện. Lãnh đạo của tất cả các cảng biển Việt nam đều được mời tham gia khảo sát điều tra này.

Nâng cao chất lượng dịch vụ tại hệ thống cảng biển hiện nay là một trong các vấn đề rất được quan tâm, đặc biệt khi Việt nam ngày càng hòa nhập vào nền kinh tế thế giới. Để có thể tham gia kinh doanh trong môi trường kinh doanh quốc tế và cạnh tranh với các cảng biển trên thế giới đòi hỏi hệ thống cảng biển nước ta cần phải đổi mới và hoàn thiện theo hướng hoạt động trong Chuỗi Cung ứng (Supply chains). Mục đích của Nghiên cứu này là xây dựng khung các nguyên tắc quản lý chất lượng thiết yếu cho cảng khi cảng tham gia hoạt động trong Chuỗi Cung ứng trên cơ sở nghiên cứu các mô hình quản lý chất lượng cảng trên thế giới và khẳng định bằng khảo sát nghiên cứu điều tra tại cảng biển Việt nam.

Đây là nghiên cứu đầu tiên về quản lý chất lượng tại cảng biển hoạt động trong Chuỗi Cung ứng và chúng tôi hy vọng rằng kết quả của khảo sát nghiên cứu này có thể giúp các doanh nghiệp cảng tìm ra cách thức quản lý chất lượng dịch vụ phù hợp với doanh nghiệp mình. Báo cáo tóm tắt kết quả của khảo sát nghiên cứu sẽ được gửi đến Ông nếu được yêu cầu.

Sự tham gia của Ông đóng góp phần rất quan trọng vào thành công của khảo sát. Khảo sát nghiên cứu này đã được Hội đồng Tasmanian Social Science Human Research Ethics Committee (human.ethics@utas.edu.au) thông qua và bảo đảm mọi thông tin do Ông cung cấp đều được giữ. Kính đề nghị Ông gửi lại phiếu điều tra theo địa chỉ ghi sẵn trên phong bì đính kèm hoặc gửi cho chúng tôi theo địa chỉ Tranth@amc.edu.au or by fax + 61 3 6335 4720 trước ngày 15-8-2009. Mọi trao đổi về các vấn đề xoay quanh nội dung của khảo sát nghiên cứu này, xin liên hệ với chị Trần Thanh Hải hoac Tiến sĩ Stephen Cahoon. Chúng tôi hân hạnh được giải đáp mọi thắc mắc của Ông.

Xin trân trọng cảm ơn!

Tiến sĩ. Stephen Cahoon — Trưởng khoa Cảng và Logistics

Trần Thanh Hải — Nghiên cứu viên

APPENDIX F. QUESTIONNAIRE - PRELIMINARY STUDY

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A STUDY ON QUALITY MANAGEMENT FOR SEAPORTS IN SUPPLY CHAINS

(Stage One)

SECTION A. QUALITY MANAGEMENT IN VIETNAMESE SEAPORTS

Please use one of the six responses to indicate the extent that you agree or disagree with each of the following statements. *(NA: not applicable, SDA: strongly disagree; DA: disagree; UN: unsure; A: agree; SA: strongly agree).*

		NA	SDA	DA	UN	A	SA
A1	All seaports should implement a quality management system	0	1	2	3	4	5
A2	Quality management has an important role for managing seaports	0	1	2	3	4	5
A3	A quality management system in seaports positively affects the performance of seaport's service	0	1	2	3	4	5

A4 Please briefly explain how quality management affects the success of your seaport. *(VI: very important; SI: slight important, I:important; SNI: slightly not important; NI: not important; NA: not applicable).*

Quality management practices currently used in seaports		Importance					
		NI	SNI	I	SI	VI	NA
B5.1	Leadership	1	2	3	4	5	0
B5.2	Customer focus	1	2	3	4	5	0
B5.3	Involvement of people	1	2	3	4	5	0
B5.4	Process and system management	1	2	3	4	5	0
B5.5	Training and education	1	2	3	4	5	0
B5.6	Continuous improvement	1	2	3	4	5	0
B5.7	Quality measurement	1	2	3	4	5	0
B4.8	Mutual beneficial relationships with suppliers	1	2	3	4	5	0
B5.9	Strategic planning	1	2	3	4	5	0
B5.10	Adoption of safety management	1	2	3	4	5	0
B5.11	Adoption of security management	1	2	3	4	5	0
B5.12	Adoption of environmental management	1	2	3	4	5	0
B5.13	Social responsibility	1	2	3	4	5	0
B5.14	Effective communication and information	1	2	3	4	5	0
B5.15	Technology system implication	1	2	3	4	5	0

A5 Please indicate the quality management system used in your seaport

Quality control ❒$_{01}$ Quality assurance ❒$_{02}$ ISO 9001 ❒$_{03}$ ISO 9001-2000❒$_{04}$

ISO 9001-2008❒$_{05}$ ISO 14001 ❒$_{06}$ AS 4801 ❒$_{07}$ Own system❒$_{08}$

A6 Please explain if another quality system is used by your seaport.

A7 Please indicate the level of importance of implementing each of following quality practices in your seaport.

A8 Please indicate other key factors in your quality system contribute to your organisational success.

SECTION B – QUALITY MANAGEMENT FOR SEAPORTS IN SUPPLY CHAINS

Please use one of the six responses to indicate the extent that you agree or disagree with each of the following statements.

	Statements	NA	SD	D	UN	A	SA
B1	Seaports should be integrated into their supply chains	0	1	2	3	4	5
B2	Operating as part of a supply chain can positively affect a seaport's performance	0	1	2	3	4	5
B3	A seaport quality management system should be a subset of the whole supply chain's quality management system	0	1	2	3	4	5
B4	My seaport is integrated into the supply chains	0	1	2	3	4	5

B5 Please explain how seaports could be better integrated into supply chains.

B6 The following table lists a range of quality-related guiding practices that may be useful for seaports when integrated into supply chains. Please circle the response that reflects the level of importance for your seaport. *(VI: very important; SI: slightly important, I: important; SNI: slightly not important; NI: not important; NA: not applicable).*

	Quality management practices for seaports integrated in the supply chains	Importance					
		NI	SNI	I	SI	VI	NA
B6.1	Direct involvement of leadership in quality decisions	1	2	3	4	5	0
B6.2	Long term commitment to quality	1	2	3	4	5	0
B6.3	Adequate resources for quality improvement	1	2	3	4	5	0
B6.4	Direct participation of top management in quality decisions	1	2	3	4	5	0
B6.5	Regular reviewing of quality issues in management meetings	1	2	3	4	5	0
B6.6	Clear quality collaboration policy with the stakeholders in the supply chain	1	2	3	4	5	0
B6.7	Exceeding customer and stakeholder expectations	1	2	3	4	5	0
B6.8	More value added services to customers	1	2	3	4	5	0
B6.9	Using customer complaints and feedback for quality purpose	1	2	3	4	5	0

B6.10	Implemented a special channel for customer complaints	1	2	3	4	5	0
B6.11	Seaport employee's commitment in providing error free outputs	1	2	3	4	5	0
B6.12	Employee's participation in quality decision making	1	2	3	4	5	0
B6.13	Creating an enjoyable and enthusiastic working environment	1	2	3	4	5	0
B6.14	Maximizing employee's skill, knowledge and expertise	1	2	3	4	5	0
B6.15	Employee's understanding of the value of the customers	1	2	3	4	5	0
B6.16	Enhancing cooperation among employees in the supply chain	1	2	3	4	5	0
B6.17	A reward system to recognize employee's quality efforts	1	2	3	4	5	0
B6.18	Regular reviewing and assessing of policies, strategies, processes	1	2	3	4	5	0
B6.19	Using a quality committee/team to improve quality	1	2	3	4	5	0
B6.20	Improvement program aims to find time and cost losses in all processes	1	2	3	4	5	0
B6.21	Tracking and fixing root causes and quality problems	1	2	3	4	5	0
B6.22	Improvement program aims to find time and cost losses in all processes	1	2	3	4	5	0
B6.23	Understanding major supply chain flows and process to reduce waste	1	2	3	4	5	0
B6.24	The development of comprehensive quality plans and procedures	1	2	3	4	5	0
B6.25	A comprehensive goal-setting process for quality	1	2	3	4	5	0
B6.26	Using a self-assessment program to identify strength and weakness	1	2	3	4	5	0
B6.27	Using KPI indicators for seaport operations and management measurement	1	2	3	4	5	0
B6.28	Using reports from internal and external audits for quality improvement	1	2	3	4	5	0
B6.29	Determining key performance indicators for seaport operations and management	1	2	3	4	5	0
B6.30	Training and education should be provided to everyone in the seaport	1	2	3	4	5	0
B6.31	Using reports from auditors, business performance and customer feedbacks for quality training purposes	1	2	3	4	5	0
B6.32	Ensuring the competency of employees by providing frequent training and education	1	2	3	4	5	0
B6.33	Continuously conducting quality training and education	1	2	3	4	5	0
B6.34	*Implementing education and training on quality for top management and employees*	1	2	3	4	5	0
B6.35	Effective policy on safety	1	2	3	4	5	0
B6.36	Effective policy on security	1	2	3	4	5	0

B6.37	The obligation of making a contribution to the public interest	1	2	3	4	5	0
B6.38	Effective policy on environmental management	1	2	3	4	5	0
B6.39	Social responsibility to the regional community	1	2	3	4	5	0
B6.40	Selecting a new stakeholder for the supply chain based on their quality of services and products	1	2	3	4	5	0
B6.41	Effective and long term collaboration and cooperation with stakeholders	1	2	3	4	5	0
B6.42	*Effective policy of stakeholder participation in quality improvement efforts*	1	2	3	4	5	0
B6.43	Technical, operational, commercial assistance availability to stakeholders	1	2	3	4	5	0
B6.44	A formal commitment of stakeholders to provide at least the same quality of services and products	1	2	3	4	5	0
B6.45	Application of an effective information technology system	1	2	3	4	5	0
B6.46	Effectiveness of the information channel among stakeholders	1	2	3	4	5	0
B6.47	Designing for an optimal and effective network	1	2	3	4	5	0
B6.48	Use one link ERP system to minimize the total costs	1	2	3	4	5	0
B6.49	*A clear system of records and feedback on quality issues from stakeholders*	1	2	3	4	5	0
B6.50	Creating trust and openness within supply chains	1	2	3	4	5	0

B7 Please explain other quality management practices that seaports should consider, particularly practices relevant for ensuring quality throughout the total supply chain.

SECTION C – DEMOGRAPHIC INFORMATION

C. 1 Please explain your seaport's major activities…….....?

C. 2 What is your current job title……...?

C. 3 What are your general responsibilities in the seaport……..?

C. 4 For how many years have you had a seaport management role……...?

C. 5 How many employees work in your organisation……?

C. 6 In which discipline is your professional background and qualifications?

Port management .....❒$_{01}$
Engineering.....❒$_{02}$
Operations.....❒$_{03}$
Marketing.....❒$_{04}$
Accounting/finance.....❒$_{05}$
Other (please specify) .....❒$_{06}$

C. 7 Would you like to receive a copy of the summary results of the study when they are available?

Yes ..... ❒$_{01}$
No..... ❒$_{02}$
Email address:..... ❒$_{03}$

This completes the survey, thank you for your valuable time
and contribution to this important study

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KHẢO SÁT ĐIỀU TRA QUẢN LÝ CHẤT LƯỢNG TẠI CẢNG BIỂN VIỆT NAM

Xin đề nghị hoàn tất trước ngày 15-9-2009

PHẦN A. QUẢN LÝ CHẤT LƯỢNG TẠI CẢNG BIỂN VIỆT NAM

Đề nghị Ông cho biết quan điểm của Ông về vai trò của quản lý chất lượng dịch vụ tại cảng biển. (KAD khong ap dung, HTKDY: hoan toan khong dong y, KDY: khong dong y, KCC: khong chac chan, DY: dong y, HTDY: hoan toan dong y).

		HTDY	DY	KDY	KC	HTKDY	KAD
A1	Tất cả các cảng biển cần áp dụng hệ thống quản lý chất lượng	5	4	3	2	1	0
A2	Quản lý chất lượng có vai trò rất quan trọng trong hoạt động sản xuất kinh doanh của cảng	5	4	3	2	1	0
A3	Áp dụng quản lý chất lượng giúp cảng đạt được kết quả kinh doanh tốt	5	4	3	2	1	0

A4 Đề nghị cho biết việc áp dụng quản lý chất lượng có góp phần tạo nên thành công của cảng?

……

……

A5 Xin đề nghị cho biết doanh nghiệp cảng của Ông áp dụng hệ thống quản lý chất lượng nào sau đây

Kiểm soát chất lượng❒$_{01}$ Bảo đảm chất lượng❒$_{02}$ ISO 9001❒$_{03}$ ISO9001-2000❒$_{04}$
ISO 9001-2008❒$_{05}$ ISO 14001 ❒$_{06}$ AS 4801❒$_{07}$ He thong rieng❒$_{08}$

A6 Nếu doanh nghiệp cảng của Ông áp dụng Hệ thống riêng của doanh nghiệp, xin đề nghị cho biết chi tiết.

……

……

A7 Ngoài các yếu tố quản lý chất lượng nêu trên xin Ông cho biết còn yếu tố nào đóng góp đáng kể vào sự thành công của doanh nghiệp cảng?

……

……

A8 Trong hệ thống quản lý chất lượng dịch vụ tại cảng, đề nghị Ông sử dụng dấu khoanh tròn để đánh giá thế về mức độ quan trọng của các yếu tố được liệt kê dưới đây (KQT: khong quan trong, KQTL: khong quan trong lam, QT: quan trong, TDQT: tuong doi quan trong, RQT: rat quan trong, KCC: khong chac chan).

	Các yếu tố quản lý chất lượng hiện đang sử dụng tại cảng	KQT	KQTL	QT	TDQT	RQT	KCC
A8 1	Vai trò của lãnh đạo trong quản lý chất lượng	1	2	3	4	5	0
A8 2	Mục tiêu hướng tới khách hàng	1	2	3	4	5	0
A8 3	Tham gia đóng góp của cán bộ công nhân viên cảng	1	2	3	4	5	0
A8 4	Khả năng của cán bộ công nhân viên cảng	1	2	3	4	5	0
A8 5	Không ngừng cải tiến chất lượng dịch vụ	1	2	3	4	5	0
A8 6	Không ngừng cải tiến các qui trình	1	2	3	4	5	0
A8 7	Áp dụng các tiêu chí đo lường chất lượng dịch vụ	1	2	3	4	5	0

A8 8	Thực hiện việc báo cáo chất lượng dịch vụ	1	2	3	4	5	0
A8 9	Thường xuyên đào tạo quản lý chất lượng	1	2	3	4	5	0
A8 10	Thực hiện chính sách quản lý an toàn lao động	1	2	3	4	5	0
A8 11	Thực hiện chính sách an ninh tai cảng	1	2	3	4	5	0
A8 12	Thực hiện chính sách	1	2	3	4	5	0
A8 13	Thực hiện chính sách quản lý chất lượng dịch vụ và sản phẩm của các nhà thầu	1	2	3	4	5	0
A8 14	Áp dụng hệ thống công nghệ tiên tiến	1	2	3	4	5	0
A8 15	Áp dụng hệ thống thông tin hiệu quả	1	2	3	4	5	0

PHẦN B – QUẢN LÝ CHẤT LƯỢNG CẢNG HOẠT ĐỘNG TRONG CHUỖI

Xin đề nghị sử dụng các thang điểm dưới đây chỉ ra mức độ đánh giá của Ông đối với việc doanh nghiệp cảng tham gia hoạt động trong Chuỗi Cung ứng

		KAD	HTDY	KDY	KCC	DY	HTDY
B1	Các cảng nên tham gia hoạt động trong Chuỗi Cung ứng	5	4	3	2	1	0
B2	Tham gia hoạt động như một phần của Chuỗi Cung ứng giúp cảng thành công hơn trong hoạt động sản xuất kinh doanh của mình	5	4	3	2	1	0
B3	Hệ thống quản lý chất lượng tại cảng cần phải là một bộ phận trong hệ thống quản lý chất lượng của toàn Chuỗi Cung ứng	5	4	3	2	1	0
B4	Doanh nghiệp cảng của chúng tối hiện đã tham gia hoạt động trong Chuỗi Cung ứng	5	4	3	2	1	0

B5 Xin cho biết các cảng nên làm thế nào để có thể hoà nhập tốt nhất trong Chuỗi Cung ứng?

B6 Bảng liệt kê dưới đây đưa ra một số yếu tố quản lý chất lượng dịch vụ có thể áp dụng cho cảng khi cảng tham gia hoạt động trong Chuỗi Cung ứng. Theo đánh giá của Ông mỗi yếu tố dưới đây có tầm quan trọng như thế thế nào? Xin đề nghị khoanh tròn vào các ô tương thích với đánh giá của Ông

	Các yếu tố quản lý chất lượng áp dụng cho cảng hoạt động trong Chuỗi Cung ứng	KQT	KQTL	QT	TDQT	RQT	KCC
B6.1	Cam kết của lãnh đạo đối không ngừng cải tiến chất lượng dịch vụ	1	2	3	4	5	0
B6.2	Lãnh đạo cảng chịu trách nhiệm trực tiếp đối với chính sách chiến lược quản lý chất lượng dịch vụ	1	2	3	4	5	0
B6.3	Áp dụng qui trình dịch vụ hướng tới chất lượng cao nhất	1	2	3	4	5	0
B6.4	Cung cấp đủ nguồn lực để cải tiến chất lượng dịch vụ	1	2	3	4	5	0
B6.5	Lãnh đạo cảng trực tiếp tham gia trong các quyết định về quản lý chất lượng	1	2	3	4	5	0

B6.6	Các vấn đề về quản lý chất lượng dịch vụ luôn được đề cập thường xuyên trong các cuộc họp	1	2	3	4	5	0
B6.7	Lãnh đạo hoạch định chính sách phối hợp rõ ràng với các doanh nghiệp hoạt động trong Chuỗi	1	2	3	4	5	0
B6.8	Mục tiêu quan trọng nhất của cảng là thoả mãn nhu cầu khách hàng	1	2	3	4	5	0
B6.9	Tăng thêm giá trị dịch vụ cho khách hàng là triết lý hoạt động của doanh nghiệp cảng	1	2	3	4	5	0
B6.10	Sử dụng mức độ thoả mãn khách hàng làm tiêu chí đánh giá chất lượng dịch vụ của doanh nghiệp	1	2	3	4	5	0
B6.11	Sử dụng phản hồi của khách hàng làm một trong các công cụ chính để cải tiến chất lượng dịch vụ	1	2	3	4	5	0
B6.12	Thiết lập mối quan hệ khăng khít giữa cảng và các doanh nghiệp hoạt động trong Chuỗi Cung ứng để phục vụ khách hàng tốt nhất	1	2	3	4	5	0
B6.13	Mức độ hiểu biết của nhân viên về gía trị của từng khách hàng đối với cảng	1	2	3	4	5	0
B6.14	Mức độ tham gia của nhân viên cảng quá trình cải tiến chất lượng dịch vụ	1	2	3	4	5	0
B6.15	Mức độ hiệu quả của việc nhân viên trực tiếp giải quyết các vấn đề về chất lượng dịch vụ	1	2	3	4	5	0
B6.16	Yêu cầu nhân viên các doanh nghiệp hoạt động trong Chuỗi có cùng trình độ tay nghề tương đương	1	2	3	4	5	0
B6.17	Nhân viên cảng cam kết cung cấp dịch vụ hoàn hảo	1	2	3	4	5	0
B6.18	Tăng cường mối quan hệ hợp tác giữa các nhân viên hoạt động trong Chuỗi Cung ứng	1	2	3	4	5	0
B4.19	Thực hiện chế độ khen thưởng tại chỗ cho các sáng kiến của CBCNV	1	2	3	4	5	0
B4.20	Xem xét và đánh giá định kỳ các chính sách chiến lược và qui trình cải tiến chất lượng	1	2	3	4	5	0
B4.21	Sử dụng một bộ phận chuyên trách về chất lượng	1	2	3	4	5	0
B4.22	Liên tục cải tiến các qui trình nhằm giảm thiểu thời gian và tổng chi chi phí	1	2	3	4	5	0
B4.23	Sử dụng hệ thống văn bản để đánh giá chất lượng dịch vụ	1	2	3	4	5	0
B4.24	Kiểm soát và không ngừng tăng cường chất lượng dịch vụ là qui trình khai thác quản lý cơ bản của doanh nghiệp cảng	1	2	3	4	5	0
B4.25	Điều phối các quan hệ khai thác và kinh doanh giữa các doanh nghiệp tham gia trong Chuỗi Cung ứng	1	2	3	4	5	0
B4.26	Các nguyên nhân tạo ra chất lượng dịch vụ kém luôn được xem xét và khắc phục kịp thời	1	2	3	4	5	0
B4.27	Tạo dựng văn hoá cảng không cung cấp dịch vụ lỗi	1	2	3	4	5	0
B4.28	Sử dụng các chỉ số kinh doanh và quản lý để đánh giá chất lượng dịch vụ	1	2	3	4	5	0

B4.29	Xác định chính xác các chỉ số kinh doanh thực hiện	1	2	3	4	5	0
B4.30	Sử dụng các báo cáo của cơ quan đánh giá chất lượng làm tiêu chí tăng cường chất lượng dịch vụ	1	2	3	4	5	0
B4.31	Áp dụng hệ thống sổ sách đánh giá chất lượng thường xuyên	1	2	3	4	5	0
B4.32	Nhân viên các doanh nghiệp trong Chuỗi Cung ứng được đào tạo cung cấp chất lượng dịch vụ như nhau	1	2	3	4	5	0
B4.33	Sử dụng các báo cáo tài chính, kiểm toán, báo cáo kết quả hoạt động sản xuất kinh doanh làm phương tiện đào tạo	1	2	3	4	5	0
B4.34	Giáo dục đào tạo được thực hiện đối với toàn bộ doanh nghiệp, từ ban lãnh đạo đến CBCNV	1	2	3	4	5	0
B4.35	Công tác giáo dục đào tạo phải được thực hiện thường xuyên liên tục	1	2	3	4	5	0
B4.36	Thực thi chính sách an toàn lao động rõ ràng	1	2	3	4	5	0
B4.37	Thực thi chính sách an ninh cảng biển	1	2	3	4	5	0
B4.38	Thực hiện chính sách quản lý an sinh môi trường	1	2	3	4	5	0
B4.39	Có trách nhiệm đóng góp vào lợi ích chung của xã hội	1	2	3	4	5	0
B4.40	Có trách nhiệm rõ ràng với cộng đồng khu vực	1	2	3	4	5	0
B4.41	Tiêu chí lựa chọn doanh nghiệp tham gia hoạt động trong Chuỗi Cung ứng dựa trên chất lượng dịch vụ	1	2	3	4	5	0
B4.42	Xác lập sự phối hợp hài hoà trong hoạt động SXKD giữa các doanh nghiệp tham gia Chuỗi Cung	1	2	3	4	5	0
B4.43	Xây dựng khung phối hợp làm việc toàn diện cho toàn bộ các doanh nghiệp tham gia Chuỗi	1	2	3	4	5	0
B4.44	Yêu cầu các doanh nghiệp tham gia trong Chuỗi không ngừng tăng cường chất lượng dịch vụ	1	2	3	4	5	0
B4.45	Sẵn sàng hỗ trợ tư vấn kỹ thuật, khai thác và kinh doanh giữa các doanh nghiệp trong Chuỗi	1	2	3	4	5	0
B4.46	Cam kết bằng văn bản giữa các doanh nghiệp trong chuỗi cung ứng dịch vụ có cùng chất lượng như nhau	1	2	3	4	5	0
B4.47	Áp dụng hệ thống công nghệ thông tin hiệu quả	1	2	3	4	5	0
B4.48	Thiết lập kênh thông tin hiệu quả giữa các doanh nghiệp trong chuỗi	1	2	3	4	5	0
B4.49	Các doanh nghiệp trong chuỗi luôn sẵn sàng tư vấn về dịch vụ doanh nghiệp mình nhằm tạo chất lượng tốt nhất cho dịch vụ chung của Chuỗi	1	2	3	4	5	0
B4.50	Giữa các doanh nghiệp trong Chuỗi thường xuyên cùng xác định mắt khâu kém chất lượng để cùng khắc phục	1	2	3	4	5	0

B5 Ngoài các yếu tố kể trên còn yếu tố quản lý chất lượng dịch vụ nào Ông cho là quan trọng các doanh nghiệp tham gia Chuỗi Cung ứng cần áp dụng.

PHẦN C – THÔNG TIN CHUNG

C 1 Xin cho biết chức năng hoạt động chính của doanh nghiệp cảng?

C 2 Xin cho biết chức vụ hiện nay của Ông?

C 3 Trọng trách chính Ông đang đảm nhiệm?

C 4 Xin cho biết bao nhiêu năm Ông bà đảm nhiệm vị trí này?

C 5 Xin cho biết số lượng CBCNV làm việc tại cảng?

C 6 Xin cho biết bằng cấp chuyên môn của Ông ?

Quản lý cảng…….....❒$_{01}$

Kỹ sư……..……..…..❒$_{02}$

Khai thác…….....❒$_{03}$

Marketing …….……....❒$_{04}$

Tài chính/Kế toán…….....❒$_{05}$

Bằng cấp khác …….……...……...❒$_{06}$

C 7 Ông có muốn nhận kết quả của khảo sát điều tra này?

Có..... ❒$_{01}$ Không……..……...❒$_{02}$

Email:…….....❒$_{03}$

APPENDIX H. VIETNAMESE SEAPORTS – VPA LIST

1. QUANG NINH PORT (Under: Vietnam National Shipping Lines)
   Add.: 1 Cai Lan street, Bai Chay ward, Ha Long City, Quang Ninh province.
   Telephone: 84.33. 3825627, Fax: 84.33.3826118, E-mail: quangninhport@vnn.vn
2. CAM PHA PORT (Under: Vietnam National Coal-Mineral Industries Group)
   Address: Ly Thuong Kiet street, Cua Ong ward, Cam Pha town, Quang Ninh province
   Telephone: 84.33.3865045, Fax: 84.33.3865320, Email: campha_port@vnn.vn
3. HAI PHONG PORT (Under: Vietnam National Shipping Lines)
   Address: 8A Tran Phu street, Hai Phong city
   Telephone: 84.31.3859945 / 859456, Fax: 84.31.3552049, E-mail: haiphongport@hn.vnn.vn
4. CUA CAM PORT JOINT-STOCK COMPANY (Under: Hai Phong City')
   Address: 2 Ngo Quyen street, Ngo Quyen district, Hai Phong city
   Telephone: 84.31.3837391, Fax: 84.31.3837393, E-mail: camport@hn.vnn.vn
5. DINH VU INVESTMENT & DEVELOPMENT CO. (Under: HaiPhong Port)
   Address: Dong Hai ward, Hai An district, Hai Phong city
   Telephone: 84.31. 3769955, Fax: 84.31. 3769945, E-mail: dinhvuport@hn.vnn.vn
6. VAT CACH PORT JOINT-STOCK COMPANY (Under: Vietnam National Shipping Lines)
   Address.: 9th Km, National Road No.5, Quan Toan ward, Hong Bang district, Hai Phong city.
   Telephone: 84.31.3850018, Fax: 84.31. 3850018–3850026, E-mail: vatcachport@vnn.vn
7. DOAN XA PORT JOINT-STOCK COMPANY (Under: Hai Phong City)
   Address: 15 Ngo Quyen str., Van My ward, Ngo Quyen dist., Hai Phong city
   Telephone: 84.31.3765029, Fax: 84.31.3765727, E-mail: doanxaport@hn.vnn.vn
   Website : www.doanxaport.com.vn
8. B12 OIL TERMINAL (Under: B12 Petroleum Company – Vietnam National Petroleum Corp.)
   Address: Quarter 1, Bai Chay, Quang Ninh Pro.
   Telephone: 84.33.846360, Fax: 84.33.847091, Email: B12oilterm@petrolimex.com.vn
   Website: http://www.camphaport.com.vn
9. TRANSVINA PORT (Under: Vietnam Hi-Tech Transportation Co., Ltd.)
   Address: 280 Ngo Quyen St., Van My ward, Ngo Quyen district, Hai Phong city
   Telephone: 84.31. 3791270, Fax: 84.31. 3741272, E-mail: transvina@hn.vnn.vn
10. NGHE TINH PORT (Under: Vietnam National Shipping Lines)
    Address: 10 Truong Thi street, Vinh city, Nghe An province
    Telephone: 84.38. 3847143, Fax: 84.38. 3847142, E-mail: portnt@vnn.vn
    Website: www.nghetinhport.com.vn
11. VUNG ANG PORT LIMITED COMPANY (Under: Ha Tinh province).
    Head office: Thanh Khe village, Thanh Trach commune, Bo Trach district, HaTinh province
    Tel.: 84.52.3866017. Fax: 84.52.3866133
12. THUAN AN PORT JOINT-STOCK COMPANY (Under: Thua Thien-Hue province)
    Address: Thuan An town, Phu Vang district, Thua Thien-Hue province
    Telephone: 84.54.3866037 / 866164, Fax: 84.54.3866164, Email: cangthuananctcp@gmail.com
    Website: www.thuananport.huecity.vn

13. CHAN MAY PORT COMPANY LIMITED (Under: Vietnam National Shipping Lines)
Address: Loc Vinh commune, Phu Loc district, Thua Thien Hue province
Telephone: 84.54. 3876096, Fax: 84.54. 3891838, E-mail: info@chanmayport.com.vn

14. DA NANG PORT (Under: Vietnam National Shipping Lines)
Address: 26 Bach Dang street, Da Nang city
Telephone: 84.511.3822513, Fax: 84.511.3822565, E-mail: cangdn@dng.vnn.vn

15. KY HA PORT - Truong Thanh Steel Co. Ltd. (Under: Ministry of Defense)
Address: Tam Quang commune, Nui Thanh district, Quang Nam province
Telephone: 84.510.3871303, Fax: 84.510.3871301, E-mail: dssco@dng.vnn.vn

16. KY HA - QUANG NAM PORT (Under: The People's Committee of Quang Nam province)
Address: Tam Quang commune, Nui Thanh district, Quang Nam province
Tel.: 84.510. 3550787 – 3550108, Fax: 84.510. 3550198, E-mail: kyhaport@dng.vnn.vn

17. QUI NHON PORT (Under: Vietnam Maritime Administration)
Address: 2 Phan Chu Trinh street, Qui Nhon city, Binh Dinh province
Tels.: 84.56.3892159 / 3892363 Fax: 84.56.3891783 E-mail: quinhonport@dng.vnn.vn
Website: http://www.cangquynhon.binhdinh.com.vn

18. NHA TRANG PORT (Under: Vietnam Maritime Administration)
Address: 5 Tran Phu street, Vinh Nguyen ward, Nha Trang city, Khanh Hoa province
Telephone: 84.58.3590021, Fax: 84.58.3590017, E-mail: nhatrangport@dng.vnn.vn
Website: www.nhatrangport.com.vn

19. THI NAI PORT (Under: Vietnam National Shipping Lines)
Address: 02 Tran Hung Dao, Quy Nhơn city, Binh Dinh province.
Telephone: 84.56. 3892991, Fax: 84.56. 3892097, E-mail: thinaiport@dng.vnn.vn

20. CAM RANH PORT (Under: Khanh Hoa Province)
Address: 9 Nguyen Trong Ky Str., cam Linh ward, Cam Ranh town, Khanh Hoa province
Telephone: 84.58.3854307 / 3854565, Fax: 84.58.3854536, E-mail: mail@camranhport.vn
Website: www.camranhport.com.vn

21. PHU MY PORT (Under: Baria Serece J. S. Company.)
Address: Phu My borough, Tan Thanh district, Ba Ria-Vung Tàu province
Telephone: 84.64.3876603, Fax: 84.64.3876600, E-mail: bariaportsales@hcm.vnn.vn
Website: www.bariaport.com

22. CAI CUI PORT (Under: Vietnam National Shipping Lines)
Address: No.02 Phu Thang zone, Tan Phu ward, Cai Rang district, Can Tho City
Phone: 84.710. 917393 – 917395, Fax: 84.710. 917394, E-mail: caicuiport@gmail.com

23. DONG NAI PORT JOINT-STOCK CO (Under: SONADEZI)
Main office: Long Binh Tan ward, Bien Hoa city, Dong Nai province
Telephone: 84.61.3832225, Fax: 84.61.3831259, E-mail: dongnaiport@vnn.vn
Website: www.dongnai-port.com

24. SAIGON NEWPORT COMPANY (Under: Ministry of Defense)
Address: End of Dien Bien Phu street, ward 22, Binh Thanh district, HCMC
Telephone: 84.8.38994388, Fax: 84.8.38993950, Email: saigonnewport@hcm.vnn.vn
Website: www.saigonnewport.com

25. SAIGON PORT CO. LTD (Under: Vietnam National Shipping Lines)
Head office: 3 Nguyen Tat Thanh street, district 4, HCMC

Telephone: 84.8.39401825 IDD call: 84.8.39401030 Fax: 84.8.39400168
E-mail: csg@hcm.vnn.vn, Website: www.csg.com.vn

26. BEN NGHE PORT LIMITED COMPANY (Under: SAMCO)
Address: Ben Nghe Str., Tan Thuan Dong ward, district 7, Ho Chi Minh city
Telephone: 84.8.38723316, Fax: 84.8.38728383, E-mail: bennghеport@hcm.fpt.vn
Website: www.bennghеport.com

27. BINH DUONG PORT JOINT-STOCK CO. (Under: Binh Duong province)
Address: Ngai Thang village, Binh Thang commune, Di An district, Binh Duong province
Telephone: 84.8.37325674, Fax: 84.8.37325673; 84.650.3749478

28. TAN THUAN DONG PORT (Under: Saigon Transport Agency Co. – TRANACO)
Address: Tan Thuan Dong ward, district 7, Ho Chi Minh city
Telephone: 84.8.3871873, Fax: 84.8.38721873, E-mail: ttdongport@hcm.vnn.vn

29. VEGETPORT J. CO (Under: Ministry of Agricultural and Rural Development)
Address: 1 Nguyen Van Quy Str., Phu Thuan ward, district 7, Ho Chi Minh city
Telephone: 84.8.37731121, Fax: 84.8.38733342, E-mail: vegeportjco@hcm.vnn.vn

30. CAT LAI OIL TERMINAL (Under: PETEC)
Address: Street No.3, Cat Lai ward, District 2, HCMC
Telephone: 84.8.38976046, Fax: 84.8.38976045, E-mail : hanghoacatlai@yahoo.com

31. SAIGON PETRO PORT (Under: SAIGON PETRO CO., LTD)
Address: Thanh My Loi ward, district 2, HCMC
Contacting address: Saigon Petro, 27 Nguyen Thong street, district 3, HCMC
Telephone: 84.8.39307078, Fax: 84.8.39307642

32. NHA BE OIL TERMINAL (Under: PETROLIMEX SAIGON)
Address: Nha Be town, Nha Be district, Ho Chi Minh city
Telephone: 84.8.38738587 / 38738588, Fax: 84.8.38738580

33. LOTUS PORT (Under: Lotus J.V. Co.)
Address: 1A Nguyen Van Quy Str., Phu Thuan ward, Dist. 7, Ho Chi Minh city
Telephone: 84.8.38730147, Fax: 84.8.38730145, E-mail: lotusportvn@hcm.vnn.vn
Website: www.lotusport.com

34. MY THO PORT JOINT STOCK CO. (Under: Tien Giang province)
Address: My Tho Industrial Zone, Binh Duc commune, Chau Thanh district, Tien Giang province
Telephone: 84.73.3853048, Fax: 84.73.3853049, E-mail: mythoport@hcm.vnn.vn

35. VINH LONG PORT JOINT-STOCK CO. (Under: Vinh Long province)
Address: 170/2 Pham Hung Str., ward 9, Vinh Long town, Vinh Long province
Telephone: 84.70.3822635 – 3826124, Fax: 84.70.3825291, E-mail: vinhthai702003@yahoo.com

36. CAN THO PORT (Under: Vietnam national Shipping Lines)
Address: 27 Le Hong Phong street, Tra Noc ward, Binh Thuy district, Can Tho city
Telephone: 84.710. 3841251, Fax: 84.710. 3841247, E-mail: cangcantho@hcm.vnn.vn

37. VUNGTAU COMMERCIAL PORT (Under: Vung Tau Commercial Port J.S.Co.)
Address: 973, 30/4 street, ward 11, Vung Tau city, Ba Ria-Vung Tau province
Email: thuongcang@vungtauport.com.vn /ops-cms@vungtauport.com.vn
Telephone: 84.64. 3848312, Fax: 84.64. 3948193, Website: www.vungtauport.com.vn

38. TRA NOC - CAN THO PORT (Under: Song Hau Food Company, VINAFOOD II)
Address: Lot 18, Tra Noc Industrical Zone, Can Tho city
Telephone: 84.71.3841328, Fax: 84.71.3841457
E-mail: sohafood_caphong@songhaufood.com.vn

39. AN GIANG PORT (Under: The people's Committee of An Giang province)
Address: National road 91, My Thanh ward, Long Xuyen city, An Giang province
Telephone: 84.76.3831535, Fax: 84.76.3831129, E-mail: mythoiport@hcm.vnn.vn
Website: www.mythoiport.com

40. VICT PORT (Under: Ministry of Planning and Investment)
Address: A5 Street, Hamlet 5, Tan Thuan Dong ward, district 7, HCM City
Telephone: 84.8. 38729999, Fax: 84.8. 38724888, E-mail: info@vict-vn.com
Website: www.vict-vn.com

41. INTERFLOUR CAI MEP

42. BINH MINH PORT

43. SPCT CONTAINER SG

APPENDIX I. PRETESTING LETTER - STAGE TWO

Date

Title:

Dear Mr.

Reference: Invitation on Pretesting second stage survey

I would like to invite you to participate in this pretesting of my data collection documents. The enclosed telephone survey is the second stage of data collection for my PhD study on quality management in seaports integrated in supply chains. Your comments will significantly assist in improving the quality of the survey and response rate.

The purpose of the study is to propose quality management practices that could be used by seaports as they become more integrated in supply chains in Vietnam. Therefore the research questions for this study are:

PRQ: *What quality management practices are suitable for Vietnamese seaports integrated in supply chains?*

SRQ1: *What quality management practices are currently being implemented in Vietnamese seaports?*

The method of data collection of this study is designed in two stages. The first stage, which is now complete, employed a mail survey sent to Vietnamese seaports. Based on the results of the first stage and updated information from the literature and other secondary sources, the survey of the second stage aims to:

- Confirm the current quality management practices used in Vietnamese seaports.
- Further investigate the internal and external quality management practices seaports could implement when operating in supply chains.

The second stage employs a quantitative and qualitative approach using a semi structured telephone interview.

The process of the survey

3. An advance letter and response cards will be sent to all forty three seniors of Vietnamese Port Association members (VPA). This represents a census of the VPA members. Before sending the enclosed documents, the advance letter, response cards and questionnaire will be translated into Vietnamese and pretested by bilingual researchers.

4. Within ten days after sending the advance letters, I will be contacting participants by phone to ask whether they are interested in having an interview, agreeing on an appointment time, and in case they cannot participate, ask them to advise another participant.

The pretesting

Please consider the attached list of suggested questions when pretesting the following documents.

3. The survey questionnaire consists of three parts. Part A enquires into the background information of the participant. Part B focuses on the seaport's generation and its current quality management. Part C tests the perceptions on the guiding quality management practices adopted by seaports in supply chains.
4. The advance letter
5. The response cards

Any thoughts on improving the enclosed documents would be appreciated.

As I am attempting to meet the ethics amendment submission on the second week of January 2011, it would be appreciated if any suggestions could be returned by 5th January 2011.

Once again thank you for your time and contribution to improving the survey documents.

Tran Thanh Hai

Research student

Department of Maritime and Logistics Management

APPENDIX J. ADVANCED LETTER - STAGE TWO

Locked Bag 1397
Launceston Tasmania 7250 Australia
Phone + 61 3 6324 9648 Fax + 61 3 6324 9720
Email; Tranth@amc.edu.au
www.amc.edu.au

Date
Title: 'First name' 'Last name'
Company:
Address City Country
Dear *'Title' 'Last name'*

Subject: 2010/2011 study on quality management for Vietnamese seaports integrated in supply chains

As a result of the useful contributions from many senior managers of Vietnamese seaports, the first stage of the study on quality management in Vietnamese seaports is complete. We are now seeking your interest to participate in the second and final stage of this major study which is being conducted by the Australian Maritime College at the University of Tasmania.

As you are aware, quality enhancement is a major concern of seaport managers. The second stage of the study investigates the quality management practices required of Vietnamese seaports as they become more integrated in supply chains. It is anticipated that the findings of this study will enable a seaport to select the most suitable quality management for it to enhance its service quality. All senior managers of the Vietnamese Port Association (VPA) members are being invited to participate in this study. As a VPA senior manager, you are someone who is able to significantly contribute to this major study. We will be contacting you by telephone in the next few days to ask you whether you are interested in participating in an interview conducted via telephone. The interviews will be conducted in Vietnamese. To assist with answering the questions, we have enclosed the response cards that will be used. The interview will take around thirty minutes.

A summary report of the results of this study is available to all participants upon request. Should you have any questions or queries about this study, please contact Tran Thanh Hai either by telephone number: +61 3 6324 9648 or email: Tranth@amc.edu.au, or Dr Stephen Cahoon at email: S.Cahoon@amc.edu.au.

Yours sincerely

Dr. Stephen Cahoon — Tran Thanh Hai

Head, Department of Maritime and Logistics Management — Researcher

APPENDIX K. THU MOI THAM GIA - GIAI DOAN 2

Locked Bag 1397
Launceston Tasmania 7250 Australia
Phone + 61 3 6324 9648 Fax + 61 3 6324 9720
Email; Tranth@amc.edu.au
www.amc.edu.au

AMC AUSTRALIAN MARITIME COLLEGE

UTAS

Kính gửi: Mr.

Tổng giám đốc cảng:

V/v: Thư mời tham gia nghiên cứu 2010/2011 quản lý chất lượng dich vụ cho cảng biển Việt nam khi hoạt động trong chuỗi Logistics/Supply chain

Nhờ có đóng góp quan trọng của lãnh đạo các cảng thuộc hệ thống cảng biển Việt nam, giai đoạn 1 của nghiên cứu phương thức quản lý chất lượng phù hợp cho cảng biển Việt nam khi hoạt động trong chuỗi Supply chain đã hoàn thành. Hiện nay giai đoạn 2 của nghiên cứu đang được xúc tiến, chúng tôi trân trọng kính mời Ông tham gia đóng góp ý kiến. Nghiên cứu này do Học viện Australian Maritime College – University of Tasmania thực hiện.

Như Ông đã biết, nâng cao chất lượng dịch vụ là một trong các mối quan tâm hàng đầu của các lãnh đạo cảng. Để cạnh tranh trong môi trường kinh doanh quốc tế, giảm tổng chi phí, thu hút khách hàng các cảng biển trên thế giới đang đổi mới theo hướng hoạt động trong chuỗi Supply chain. Trên cơ sở nghiên cứu các cảng hoạt động trong chuỗi trên thế giới, nghiên cứu này nhằm tìm ra mô hình quản lý chất lượng phù hợp cho cảng biển Việt nam.

Là thành viên của Hiệp hội cảng biển Việt nam, ý kiến đóng góp của Ông vô cùng quan trọng cho sự thành công của nghiên cứu này. Chúng tôi sẽ liên lạc với Ông trong một vài ngày tới và mong muốn được biết Ông có thể thu xếp một cuộc phỏng vấn khoảng 30 phút qua điện thoại, trong khoảng thời gian phù hợp nhất với Ông.

Báo cáo tóm tắt kết quả của khảo sát nghiên cứu sẽ được gửi đến Ông nếu được yêu cầu. Nếu Ông có bất kỳ yêu cầu nào liên quan đến nghiên cứu này, đề nghị liên hệ với Ms. Trần Thanh Hải, số điện thoại +61 3 6324 9648, email Tranth@amc.edu.au hoặc Tiến sĩ Stephen Cahoon, email: S.Cahoon@amc.edu.au.

Xin trân trọng cảm ơn!

Stephen Cahoon
Tiến sĩ

Trần Thanh Hải
Nghiên cứu viên

APPENDIX L. CONSENT FORM

Locked Bag 1397
Launceston Tasmania 7250 Australia
Phone + 61 3 6324 9648 Fax + 61 3 6324 9720
Email; Tranth@amc.edu.au
www.amc.edu.au

AUSTRALIAN MARITIME COLLEGE

UTAS

Project title: *2010 Study on quality management for Vietnamese seaports integrated into supply chains*

By signing this form, I agree that:

1. I have and understood the information presented in the 'Information Sheet' about a study being conducted by Tran Thanh Hai, Australian Maritime College.
2. I understand that the study involves 30 minutes telephone interview to discuss issues regarding opinion and perceptions of a seaport's manager on quality management for seaports.
3. I have been explained the purpose and procedure of this study and understood that my participation is low-risk and non-sensitive issues will be addressed during interviewing.
4. I have satisfied with all the answers to my questions given by researcher. I am free now. In the future, I may ask questions about the result or outcomes of this study.
5. I understand that all research data will be securely stored on the Australian Maritime College premises for five years and will then be destroyed.
6. I understand that the researcher will maintain my identity confidential and that any information I supply to the researcher(s) will be used only for the purposes of the research.
7. I agree that research data gathered from me for the study may be published provided that I cannot be identified as a participant.
8. I agree to participate in this investigation and understand that I may withdraw at any time without any effect, and if so I wish, may request any data I have supplied to date be withdrawn from the research.

Name of participant : ……. Date:…….
Signature :……

9. Statement by researcher:

☐ I have explained the telephone interview and the implications of participation in it to this volunteer participant. I believe that the consent is informed and that he/she understands the implications of the participation.

If the researcher has not had an opportunity to talk to participants prior to them participating, the following must be ticked.

☐ The participant has received the Information Sheet where my details have been provided so participants have the opportunity to contact my prior to consenting to participate in this project.

Name of researcher:……. Date:…….
Signature …….

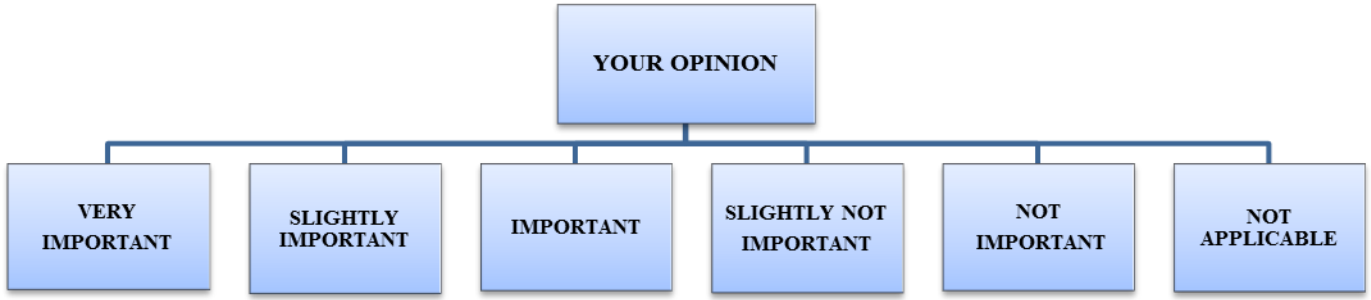
APPENDIX M. RESPONSE CARDS

RESPONSE CARD A

PLEASE USE THIS CARD TO ANSWER THE STUDY QUESTIONS

There is no right or wrong answer

Only your opinion matters



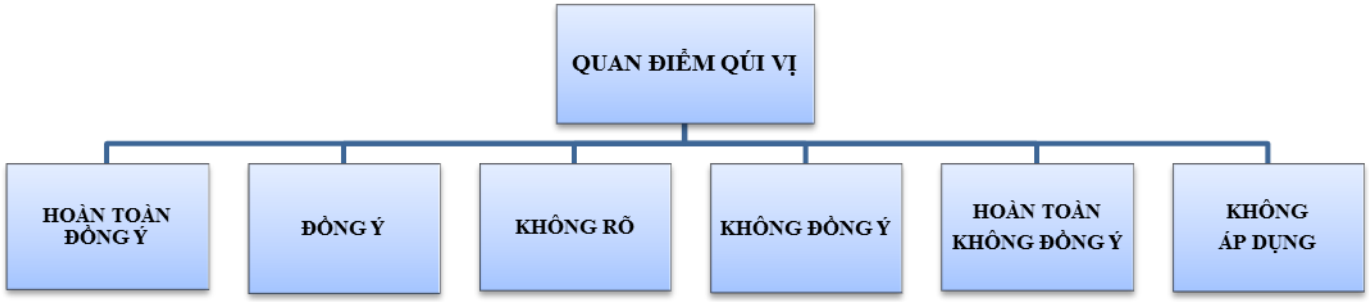
Study on quality management for seaports
Integrated in supply chains

RESPONSE CARD A

SỬ DỤNG CARD NÀY ĐỂ TRẢ LỜI CÂU HỎI

Không có câu trả lời đúng hay sai

Chỉ là quan điểm của Quí vị



Nghiên cứu về quản lý chất lượng cho cảng bien trong chuỗi supply chain

RESPONSE CARD B

PLEASE USE THIS CARD TO ANSWER THE STUDY QUESTIONS

There is no right or wrong answer

Only your opinion matters

Leadership	**Customer focus**	**Human resources**	**Continuous improvement**
Process management	**Training and education**	**Performance measurements**	**Social benefits**
Quality integration	**Network optimisation**	**Information and technology**	**Quality culture**

Study on quality management for seaports
Integrated in supply chains

RESPONSE CARD B

SỬ DỤNG CARD NÀY ĐỂ TRẢ LỜI CÂU HỎI

Vai tro lanh dao	Huong toi khach hang	Nguon nhan luc	Cai tien lien tuc
Quan ly qui trinh	Giao duc va dao tao	Do luong chat luong	Trach nhiem cong dong
Chat luong hoa nhap	Toi gian hoa mang luoi	Cong nghe thong tin	Van hoa chat luong

Nghiên cứu về quản lý chất lượng cho cảng bien
trong chuỗi supply chain

APPENDIX N. INTERVIEW CONFIRMATORY

TELEPHONE LOG

Respondent:……..Date 1:…….2011
Position:……...Time 1:…….am/pm
Company Name:……...Date 2……..2011
Telephone:……Time 2:……am/pm
Mobile: Email:

Good morning/afternoon Mr/Mrs/ ……

I am Tran Thanh Hai from the Australian Maritime College. Recently, I sent you a letter in relation to a major study being conducted on quality management practices for Vietnamese seaports integrated into supply chains.

I am calling to ask whether you are willing to participate in this important study. All VPA seaport seniors are also being invited to contribute their opinions to this study.

The study will be conducted by a telephone interview, which involves asking a range of questions on how your seaport conducts its quality management now and in the future. As indicated in the letter you received, in appreciation of your participation, a summary report of this study will be sent to you upon request. I believe the results of this study will be of value to benchmark your seaport quality management practices against other Vietnamese seaports and to gain an insight into how quality management may be changing for seaports.

Your contribution is important for this study. Are you able to participate in this study?

(Pause and wait for the response)

(Go to next page)

<table>
<tr><th>If respondent says YES</th><th>If respondent says NO</th></tr>
<tr><td>1. If respondent wants the interview now
Thank you, in the letter I sent few days ago, there are two response cards that we will use for the interview, do you have them handy? If you are ready, can we start now?
(Go to the Introduction in the questionnaire and start the interview)</td><td>Then go to Questionnaires
1. Is there anyone else in your organisation who may be interested in participating in this study?
YES → Name:
Telephone:
Email:
NO → Go to question 2</td></tr>
<tr><td>2. If respondent asks to arrange other time
When is the best time for you?
Date:
Time:
Respondent’s name:
Vietnamese time:
Australian time:

Declaration A
Thank you for your valuable time in assisting me in this study. I will contact you again on....
(mention agreed date and time above)</td><td>2. Could I ask you two quick questions that would significantly assist this study?
Yes → Go to Question 3, 4 and Declaration B
No → Go to Declaration B
3. Which quality management system does your seaport use?
.....
.....
.....
4. Does implementation of appropriate quality management become sustainability of your seaport as your seaport becomes more integrated in supply chains?
Yes No
.....
.....
.....
Declaration B
Thank you for your valuable time</td></tr>
</table>

APPENDIX O. QUESTIONNAIRE – MAIN STUDY

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Phone + 61 3 6324 9648 Fax + 61 3 6324 9720
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www.amc.edu.au

AUSTRALIAN MARITIME COLLEGE

UTAS

CONFIDENTIAL

2010/2011 STUDY ON QUALITY MANAGEMENT IN VIETNAMESE SEAPORTS INTEGRATED IN SUPPLY CHAINS

(Stage Two)

Code number:

Date of interview: / /2011

Start time:

Completion time:

Length of interview:

INTRODUCTION Goodmorning Mr/Ms…… This is Tran Thanh Hai from the Australian Maritime College. I am calling you regarding a study on quality management in Vietnamese seaports. During our last conversation you mentioned this is a good time for you to share your opinion on the study. Is now still a convenient time for you?	❒ Yes → *Go to A* ❒ No → *Go to B*
A. As mentioned in the letter, this telephone survey will take around thirty minutes. The survey investigates which quality management practices are appropriate to help Vietnamese seaports as they become more integrated in supply chains in the next few years. The questionnaire consists of three parts based on the results from the first stage survey. Whilst part A is demographic information, part B is about your seaport and its quality management system currently being used. Part C proposes possible quality management practices for seaports integrated in supply chains.	
With the letter you should have received the response cards. Do you have the response cards available with you?	❒ Yes → *Thank you* ❒ No → *Send via fax or email*
Would you mind if I record the interview in order to be sure of recording your response correctly?	❒ Yes → *Continue the interview* ❒ No → *Explain the importance of recording*
B. What is another time suitable for you?	❒ Yes → *Note in Tel. Confirmatory* ❒ No → *Ask for another contact person*

SECTION A – DEMOGRAPHIC INFORMATION

A1. To begin, could you please explain your position and major responsibilities in your seaport?

.....
.....

A2. And what is your professional background *(if more than one, please indicate your primary background)*?

Quality management	❒01
Management	❒02
Operations	❒03
Engineering	❒04
Other (please specify)	❒05

A3. For how many years have you had a quality management-related role in seaports?

1-3 years	❒01
4-6 years	❒02
7-9 years	❒03
10 years and more	❒04
None	❒05

A4. Could you please briefly explain about your seaport organisation for instance its location, ownership, major activities?

.....
.....

A5. What is the annual throughput of your seaport?

.....
.....

A6. In relation to the cargo handled annually, please estimate the percentage of:

Bulk cargo	%
Container	%
General cargo	%
Petroleum	%
Other	%

SECTION B – SEAPORT AND QUALITY MANAGEMENT

Please use one of the six responses to indicate the extent that you agree or disagree with each of the following statements.

	SD	D	UN	A	SA	NA
B1. All seaports should implement a quality management system	1	2	3	4	5	0
B2. A quality management system in seaports positively affects the performance of seaport's service	1	2	3	4	5	0

B3 To again a comparative advantage and stay sustainable for the long run we choose quality improvement as the most economical way rather than investing in facilities or expanding seaports 1 2 3 4 5 0

B4. In your seaport, what formal quality management system is currently being used?

Quality control	❒01	ISO 9001	❒05
Quality assurance	❒02	ISO 9001-2000	❒06
TQM	❒03	ISO 9001-2008	❒07
ISO 14001	❒04	Own system	❒08

B5. Please indicate which of the following practices is in your quality management system and use one of the six responses to indicate the level of their importance to your organisation. *(VI: very important; SI:slight important, I:important; SNI: slightly not important; NI: not important; NA: not applicable).*

		Importance					
	Quality management practices currently used in seaports	NI	SNI	I	SI	VI	NA
B5.1	Leadership	1	2	3	4	5	0
B5.2	Customer focus	1	2	3	4	5	0
B5.3	Involvement of people	1	2	3	4	5	0
B5.4	Process and system management	1	2	3	4	5	0
B5.5	Training and education	1	2	3	4	5	0
B5.6	Continuous improvement	1	2	3	4	5	0
B5.7	Quality measurement	1	2	3	4	5	0
B4.8	Mutual beneficial relationships with suppliers	1	2	3	4	5	0
B5.9	Strategic planning	1	2	3	4	5	0
B5.10	Adoption of safety management	1	2	3	4	5	0
B5.11	Adoption of security management	1	2	3	4	5	0
B5.12	Adoption of environmental management	1	2	3	4	5	0
B5.13	Social responsibility	1	2	3	4	5	0
B5.14	Effective communication and information	1	2	3	4	5	0
B5.15	Technology system implication	1	2	3	4	5	0

B6. Please indicate other key quality management practices contribute to your organisational success

.....

.....

B7. How often does your seaport use external auditors for assessing your quality management system? What is benefit of having this assessment in your opinion?

.....

.....

B8. Do you think, quality management is being used in your organization is appropriate?

.....

.....

B9. If you wish to change your current quality management in your seaport organization, which part or direction you will change?

B10. Seaports should be integrated into supply chains to reduce their costs and increase their performance, what is your opinion?

.....
.....

SECTION C – QUALITY MANAGEMENT FOR SEAPORTS IN SUPPLY CHAINS

As a result of the findings from the first survey, twelve quality management practices were identified that may be appropriate for seaports integrated in supply chains. Could you please use Response Card A when necessary to reflect the level of agreement according to your opinion?

(VI: very important; SI: slightly important, I: important; SNI: slightly not important; NI: not important; NA: not applicable).

	LEADERSHIP	VI	SI	I	SNI	NI	NA
L1	Leadership directly involving and participating in quality decisions	5	4	3	2	1	0
L2	Having long term commitment to quality	5	4	3	2	1	0
L3	Allocating of adequate resources for quality improvement	5	4	3	2	1	0
L4	Regularly reviewing quality issues in management meetings	5	4	3	2	1	0
L5	Establishing a clear quality collaboration policy with the stakeholders in the supply chain	5	4	3	2	1	0
L6	*A clear, reliable target in line with needs and expectations of the other stakeholders*	*5*	*4*	*3*	*2*	*1*	*0*

L7 Do you believe the top leaders should understand the benefits of quality management and motivate the other stakeholders to participate in quality management processes?

.....
.....

The next set of statements relates to having a Customer Focus. Using Response Card A please indicate the level of agreement with the following statements.

	CUSTOMER FOCUS	VI	SI	I	SNI	NI	NA
C1	Exceeding customer and stakeholder expectations	5	4	3	2	1	0
C2	Creating value added services to customers	5	4	3	2	1	0
C3	Using of customer complaints and feedback for quality purpose	5	4	3	2	1	0
C4	Employing a special channel for customer complaints	5	4	3	2	1	0
C5	*Evaluating the core stakeholder of a supply chain as the most important customer*	*5*	*4*	*3*	*2*	*1*	*0*

C6 In your opinion, what can a seaport do for the stakeholders and customers to maximise the efficiency of supply chains?

.....
.....

Now we focus on the Human Resource practice. Please look at Response Card A and use one of the responses in the card to answer the levels of agreement of the following statements.

	HUMAN RESOURCE	VI	SI	I	SNI	NI	NA
HR1	Seaport employee's commitment in providing error free outputs	5	4	3	2	1	0
HR2	Employee participating in quality decision making	5	4	3	2	1	0
HR3	Maximizing employee's skill, knowledge and expertise	5	4	3	2	1	0
HR4	Creating an enjoyable enthusiastic working environment for employees	5	4	3	2	1	0
HR5	Employee's understanding of the value of the customers	5	4	3	2	1	0
HR6	Enhancing cooperation among employees in the supply chain	5	4	3	2	1	0
HR7	Adopting reward system to recognize employee's quality efforts	5	4	3	2	1	0

HR8 For the long run benefits of seaport and supply chain, what factors of human resource do you think are important?

The next two practices are Performance Measurement and Continuous Improvement. Please view Response Card A. Use one of the six responses to indicate your level of agreement for each following statement.

	PERFORMANCE MEASUREMENTS	VI	SI	I	SNI	NI	NA
PF1	Determining appropriate quality performance indexes in the context of supply chains	5	4	3	2	1	0
PF2	Using KPI indicators for seaport operations and management measurement	5	4	3	2	1	0
PF3	Using a teamwork specialised for quality improvement	5	4	3	2	1	0
PF4	Using performance indexes to find time and cost losses in all processes of supply chain	5	4	3	2	1	0
PF5	*Achieving good overall financial performances (e.g. ROA, ROI, ROS)*	5	4	3	2	1	0

	CONTINUOUS IMPROVEMENT	VI	SI	I	SNI	NI
CI1	Developing comprehensive quality plans and procedures	5	4	3	2	1
CI2	Setting a comprehensive goal process for quality	5	4	3	2	1
CI3	Using a self-assessment program to identify strength and weakness	5	4	3	2	1
CI4	Improving programs aimed to find time and cost losses in all processes	5	4	3	2	1
CI5	Using reports from internal and external audits for quality improvement	5	4	3	2	1
CI6	Determining key performance indicators for seaport operations and management	5	4	3	2	1

Now, we are in the second half of the interview. The following questions relate to Training and Education practice and Social Benefits. Please use Response Card A to indicate the level of your agreement with the following statements.

	TRAINING AND EDUCATION	VI	SI	I	SNI	NI	NA
ED1	Training and education should be provided to everyone in the seaport	5	4	3	2	1	0
ED2	Using reports from auditors, business performance and customer feedbacks for quality training purposes	5	4	3	2	1	0
ED3	Ensuring the competency of employees by providing frequent training and education	5	4	3	2	1	0
ED4	Continuously conducting quality training and education	5	4	3	2	1	0

	SOCIAL BENEFITS	VI	SI	I	SNI	NI	NA
SB1	Effective policy on safety	5	4	3	2	1	0
SB2	Effective policy on security	5	4	3	2	1	0
SB3	The obligation of making contribution to public interest	5	4	3	2	1	0
SB4	Effective policy on environmental management	5	4	3	2	1	0
SB5	Social responsibility to the regional community	5	4	3	2	1	0

SB6 What other factors do you think a seaport and supply chain should do to contribute to social benefits (responsibility: create more jobs to local community, organize donation activities, events etc)?

.....
.....

The next practice is Process Management. When I am referring to Process I mean the movement of cargo flows, financial and information flows through the supply chains, I would like to have your level of agreement with the following statements. Please use Response Card A.

	PROCCESS MANAGEMENT	VI	SI	I	SNI	NI	NA
PM1	*Ability to manage delays and congestions at seaports*	5	4	3	2	1	0
PM2	*Readiness and availability of seaport facilities and services*	5	4	3	2	1	0
PM3	Improvement program aims to find time and cost losses in all processes	5	4	3	2	1	0
PM4	Understanding major supply chain flows and process to reduce waste	5	4	3	2	1	0
PM5	*Adopting contingency management system for unexpected events (order change or cancellation, computer network down*	5	4	3	2	1	0
PM6	*Standardising processes, procedures and practices*	5	4	3	2	1	0
PM7	*Increasing responsiveness to demand changes*	5	4	3	2	1	0
PM8	*Implementing appropriate tools and practices to reduce all wastes*	5	4	3	2	1	0

PM9	*Sharing knowledge about core business processes with stakeholders*	*5*	*4*	*3*	*2*	*1*	*0*
PM10	*Ability to manage risks and incidents*	*5*	*4*	*3*	*2*	*1*	*0*

PM11 In your experiences what other factors of process management contribute to success and efficiency of supply chain movement? Could you please suggest?

Quality Integration is a newly identified practice for a seaport operating in supply chains. Please view Response Card A. Using one of the six responses, please indicate your level of agreement with each statement.

	QUALITY INTEGRATION	VI	SI	I	SNI	NI	NA
QI1	Selecting a new stakeholder for the supply chain based on their quality of services and products	5	4	3	2	1	0
QI2	Having an effective and long term collaboration and cooperation with stakeholders	5	4	3	2	1	0
QI3	Prvoding technical, operational, commercial assistance to stakeholders	5	4	3	2	1	0
QI4	A formal commitment of stakeholders to provide at least the same quality of services and products	5	4	3	2	1	0
QI5	*Gaining an accurate forecast by close coordination and collaboration with stakeholders*	5	4	3	2	1	0
QI6	*Adoption of a inter-organisational teamwork for quality assessment*	5	4	3	2	1	0

QI7 Do you think a seaport should ensure the competence of employees required by a dominant (control) stakeholder in a supply chain? And why?

.....
.....

QI8 What is your opinion on the following statement: the relationships between the seaport and other stakeholders should be based on mutual trust rather than on contractual obligations?

.....
.....

Now, I would like you to have your assessment on Network Optimization practices. Please view Response Card A to indicate the level of your agreement with the following statements.

	NETWORK OPTIMISATION	VI	SI	I	SNI	NI	NA
NW1	Designing an optimal and effective network	5	4	3	2	1	0
NW2	*Ability to use outsourcing intermediaries to find reliable vendors in unfamiliar parts*	5	4	3	2	1	0
NW3	Minimise the effects of reverse supply chains	5	4	3	2	1	0
NW4	*Use paper less system to minimize the total costs*	5	4	3	2	1	0
NW5	*Ability to collaborate with the stakeholders in adjust redesigning process, and products to accommodate market changes*	5	4	3	2	1	0
NW6	Use one link ERP system to minimise the total costs	5	4	3	2	1	0

NW7 To avoid negative effects on the movement of products a seaport should consider involving in a too complex supply chains (too many stakeholders are involved), what is your idea about this?

In the next practice, the questions focus on Information and Technology. Please use one of the six responses in Response Card A to indicate the level of your agreement on the following statements.

	INFORMATION AND TECHNOLOGY	VI	SI	I	SNI	NI	NA
IT1	Applying of an effective information technology system	5	4	3	2	1	0
IT2	*Effective use of the enterprise resource planning systems*	5	4	3	2	1	0
IT3	*Using one intra-link system by all stakeholders to facilitate supply chain flows* (IT3)	*5*	*4*	*3*	*2*	*1*	*0*
IT4	*Using a smart or automatic identification system to facilitate cargoes flows*	*5*	*4*	*3*	*2*	*1*	*0*
IT5	*Ability to implement new information technology programs to facilitate seaport and supply chain activities*	*5*	*4*	*3*	*2*	*1*	*0*
IT6	*Sharing real time data with stakeholders*	*5*	*4*	*3*	*2*	*1*	*0*

IT7 What is your view of the following statement: the seaport should collect necessary data and information from the other stakeholders to identify potential problems that may occur in any process of a supply chain?

.....
.....

A Quality Culture is a practice that is necessary for any organisation to operate in the multinational business environment. Please use the Response Card A to indicate your level of agreement to the following statements.

	QUALITY CULTURE	VI	SI	I	SNI	NI	NA
QC1	*Building the reliability and a good image*	5	4	3	2	1	0
QC2	*Providing constant support, assistance to stakeholders*	*5*	*4*	*3*	*2*	*1*	*0*
QC3	Building trust, reliable and sharing environment	*5*	*4*	*3*	*2*	*1*	*0*
QC4	*Offering cost effective and better services*	*5*	*4*	*3*	*2*	*1*	*0*

QC5 Is there any culture difference between the stakeholders in global supply chains? And if yes, what a seaport should do to minimise the negative impact of this difference?

C13. Next, I have a list of 12 practices that research has indicated as being important for quality management. Please look at Response Card B and in thinking about your seaport quality management, could you please rank them in order of importance, where one is the most important.

Leadership	❒	Customer focus	❒
Human resource	❒	Continuous improvement	❒
Performance measurements	❒	Training, education	❒
Social benefits	❒	Process management	❒
Quality integration	❒	Network optimisation	❒
Information Technology	❒	Quality culture	❒

C14. This brings us to the end of the formal part of the interview, would you like to receive a copy of the summary results of the study when they are available?

Yes ❒01
Email …… ❒02
No ❒03

Are there any questions you would like to ask or important issues I may not have asked? For example, would you like to make any comments on:

(a) Role of industry bodies (VPA, VINALINES, VINAMARINE)?
(b) The current challenges for Vietnamese seaports?
(c) The role of a steering committee to harmonise the movement of supply chains?
(d) The impact of central control from Government (regulations)

Thank you very much for your time and valuable contribution to this important study.

APPENDIX P. CAU HOI - GIAI DOAN 2

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AUSTRALIAN MARITIME COLLEGE

UTAS

CONFIDENTIAL

2010/2011 NGHIÊN CỨU QUẢN LÝ CHẤT LƯỢNG DỊCH VỤ TAI CẢNG BIỂN VIỆT NAM KHI HOẠT ĐỘNG TRONG CHUỖI SUPPLY CHAIN

(Giai đoạn 2)

Số code:

Ngày interview: / /2011

Thời gian bắt đầu:

Thời gian kết thúc:

PHẦN A – THÔNG TIN CHUNG

A1. Xin Ông/Bà cho biết chức vụ và trọng trách đảm nhiệm?

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A2. Bằng cấp chuyên môn của Ông/Bà *(nếu từ 2 bằng cấp trở lên, đề nghị Ông/Bà cho biết bằng cấp chính)*?

Quản lý chất lượng ❒01
Kỹ sư ❒02
Khai thác ❒03
Quản lý ❒04
Ngành nghề khác (cụ thể) ❒05

A3. Ông/Bà cho biết thời gian Ông/Bà đảm nhiệm công tác liên quan đến QLCL cảng?

1-3 năm ❒01
4-6 năm ❒02
7-9 năm ❒03
10 năm trở lên ❒04
Chưa năm nào ❒05

A4. Xin Ông/Bà cho biết về tỷ lệ hàng thông qua cảng:

Hàng rời %
Container %
Hàng bách hoá %
Petroleum %
Các loại hàng hoá khác %

PHẦN B – CẢNG BIỂN VÀ QUẢN LÝ CHẤT LƯỢNG TẠI CẢNG

Đề nghị Ông/Bà cho biết đánh giá của Ông/Bà với các ý kiến dưới đây, trong đó: *SA: hoàn toàn đồng ý; A: đồng ý , UN: không chắc chắn; DA: không đồng ý; SD: hoàn toàn không đồng ý; NA: không áp dụng.*

		SD	D	UN	A	SA
B1.	Tất cả các cảng biển cần triển khai một hệ thống quản lí chất lượng	1	2	3	4	5
B2.	Ap dụng quản lý chất lượng góp phần cải thiện và nâng cao chất lượng dịch vụ của cảng	1	2	3	4	5

B3. Hiện nay doanh nghiệp cảng của Ông/Bà đang áp dụng hình thức quản lý chất lượng nào?

Quality control	❒01	ISO 9001	❒05
Quality assurance	❒02	ISO 9001-2000	❒06
TQM	❒03	ISO 9001-2008	❒07
ISO 14001	❒04	Hệ thống riêng	❒08

B4. Xin Ông/Bà hãy đánh giá các chính sách quản lí chất lượng sau dựa trên 6 mức độ đánh giá: *NI: Không quan trọng, SNI: không quan trọng lam; QT: quan trọng; SI: tương đối quan trọng, VI: rất quan trọng, A: không ap dung*.

	Các chính sách quản lí chất lượng được dùng trong cảng biển	NI	SNI	I	SI	VI	NA
B4.1	Cam kết của lãnh đạo	1	2	3	4	5	0
B4.2	Chính sách hướng tới khách hàng	1	2	3	4	5	0
B4.3	Sự tham gia của nhân viên	1	2	3	4	5	0
B4.4	Liên tục cải tiến	1	2	3	4	5	0
B4.5	Giáo dục và đào tạo	1	2	3	4	5	0
B4.6	Quản lý qui trình	1	2	3	4	5	0
B4.7	Đo lường chất lượng	1	2	3	4	5	0
B4.8	Lợi ích cộng đồng	1	2	3	4	5	0
B4.9	Quan hệ tốt với nhà cung cấp	1	2	3	4	5	0
B4.10	Quản lí an toàn	1	2	3	4	5	0
B4.11	Quản lí an ninh bến cảng	1	2	3	4	5	0
B4.12	Bảo vệ môi trường	1	2	3	4	5	0
B4.13	Quản lý chất lượng nhà cung cấp	1	2	3	4	5	0
B4.14	Áp dụng kênh liên lạc hiệu quả	1	2	3	4	5	0
B4.15	Áp dụng công nghệ thông tin hiệu quả	1	2	3	4	5	0

B5. Xin Ong/Bà hãy cho biết một vài chính sách khác có thể được áp dụng trong quá trình quản lí chất lượng vận tải biển.

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B6. Xin cho biết công ty của Ông/Bà có sử dụng chuyển viên kiểm tra hệ thống quản lí chất lượng không? Nếu có, việc kiểm định này có hay diễn ra thường xuyên?

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B7. Theo Ông/Bà các cảng biển nên hoạt động trong Chuỗi Supply chains

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B8. Tham gia hoạt động trong Chuỗi sẽ ảnh hưởng tích cực đến doanh số của cảng

PH ẦN C – QUẢN LÝ CHẤT LƯỢNG CẢNG TRONG CHUỖI

Kết quả của khảo sát lần thứ nhất ban đầu đã đưa 12 của công tác quản lý nâng cao chất dịch vụ áp dụng cho cảng biển tham gia hoạt động trong chuỗi supply chain. Đề nghị Ông/Bà cho biết đánh giá của Ông/Bà với các ý kiến dưới đây, trong đó: *NI: Không quan trọng, SNI: không quan trọng lam; QT: quan trọng; SI: tương đối quan trọng, VI: rất quan trọng, NA: không ap dung*

VAI TRÒ LÃNH ĐẠO	VI	SI	I	SNI	NI	NA

C1.1	Trực tếp tham gia vào các quyết định về quản lí chất lượng	5	4	3	2	1	0
C1.2	Lãnh đạo cảng cần kéo dài cam kết với việc nâng cao chất lượng cảng	5	4	3	2	1	0
C1.3	Cung cấp đủ nguồn lực để nâng cao chất lượng dịch vụ	5	4	3	2	1	0
C1.4	Các vấn đề về quản lì chất lượng dịch vụ luôn được đề cập thường xuyên trong các cuộc họp	5	4	3	2	1	0
C1.5	Hoạch định rõ mục tiêu chiến lược chính sách, phối hợp rõ ràng giữa các doanh nghiệp hoạt động trong chuoi	5	4	3	2	1	0
C1.6	Lãnh đạo cảng cần đặt ra kế hoạch mục tiêu rõ ràng sau khi đã đề rõ những nhu cầu và dự tính của các doanh nghiệp khác	5	4	3	2	1	0

C1.7 Ông/Bà có cho rằng các lãnh đạo cần hiểu rõ lợi ích của công tác quản lí chất lượng và khuyến khích các doanh nghiệp vào quá trình quản lí chất lượng dịch vụ của Chuỗi Supply chains?

Những ý kiến sau có liên quan đến những chính sách hướng tới khách hàng. Xin Ông/Bà hãy cho biết đánh giá cho những ý kiến dưới đây.

	C2. HUONG TOI KHACH HANG	VI	SI	I	SNI	NI	NA
C2.1	Mục tiêu quan trọng nhất của cảng là thỏa mãn nhu cầu khách hàng	5	4	3	2	1	0
C2.2	Cảng biển cần cam kết tạo ra nhiều dịch vụ giá trị gia tăng cho khách hàng	5	4	3	2	1	0
C2.3	Sử dụng phản hồi của khách hàng làm một trong các công cụ chính để tăng cường chất lượng dịch vụ	5	4	3	2	1	0
C2.4	Cảng biển cần áp dụng các kênh riêng để xử lý các khiếu kiện của khách hàng	5	4	3	2	1	0
C2.5	Doanh nghiệp mấu chốt của Chuỗi là khách hàng quan trọng nhất	5	4	3	2	1	0

C2.6 Theo ý kiến của Ông/Bà, cảng biển cần làm gì với các doanh nghiệp tham gia chuôi supply chain để góp phần giúp chuỗi supply chain làm việc hiệu quả?

	C3. QUẢN LÍ NHÂN LỰC	VI	SI	I	SNI	NI	NA
C3.1	Nhân viên cảng biển cam kết cung cấp dịch vụ có chất lượng	5	4	3	2	1	0
C3.2	CBCNV tham gia vào các quyết định về quản lý chất lượng	5	4	3	2	1	0
C3.3	Doanh nghiệp cảng biển phải tạo được môi trường làm việc tốt để gắn bó CBCNV	5	4	3	2	1	0
C3.4	Tối đa hóa việc sử dụng kiến thức trình độ và năng lực cua CBCNV	5	4	3	2	1	0
C3.6	Mức độ hiểu biết của nhân viên về giá trị của từng khách hàng với cảng	5	4	3	2	1	0
C3.7	Tăng cường sự hợp tác chặt chẽ của các nhân viên trong chuỗi	5	4	3	2	1	0

C3.8	Cảng biển áp dụng hệ thống khen thưởng và khuyến khích với thành tích của CBCNV	5	4	3	2	1	0

C3.9 Vì lợi ích lâu dài cua cảng biển và của CBCNV, các yếu tố nào về quản lý nguồn nhân lực Ông/Bà có cho rằng quản lí nhân sự là cần thiết?

Xin Ông/Bà hãy xem những bảng sau, tập trung vào yếu tố Đo Lường Chất Lượng và Cải Tiến Chất Lượng điều hành của các cảng biển và cho biết ý kiến đánh giá dựa theo mức độ đồng tình.

	C4. CẢI TIẾN CHẤT LƯỢNG	VI	SI	I	SNI	NI	NA
C4.1	Xem xét và đánh giá định kỳ các chính sách chiến lược và qui trình cải tiến chất lượng	5	4	3	2	1	0
C4.2	Áp dụng qui trình đánh giá chất lượng tốt có mục tiêu rõ ràng	5	4	3	2	1	0
C4.4	Áp dụng hệ thống tự đánh giá các điểm mạnh, yếu trong từng qui trình sản xuất của cảng và của chuỗi nói chung	5	4	3	2	1	0
C4.5	Sử dụng các chỉ số KPI cho các tiêu chi để đo lường điều hành chất lượng	5	4	3	2	1	0
C4.6	Sử dụng báo cáo kiểm toán cho công tác tăng cường chất lượng dịch vụ	5	4	3	2	1	0
C4.7	Cảng biển cần thiết lập các tiêu chí cụ thể thực tế đối với thời gian giải phóng hàng, giải phóng tàu	5	4	3	2	1	0

	C5. ĐO LƯỜNG CHẤT LƯỢNG	VI	SI	I	SNI	NI	NA
C5.1	Xem xét và đánh giá định kỳ các chính sách chiến lược và quy trình cái tiến chất lượng	5	4	3	2	1	0
C5.2	Sử dụng đội chuyên trách cho công tác chất lượng	5	4	3	2	1	0
C5.3	Cải tiến cách thức làm việc để khắc phục các tổn thất thời gian và vốn trong mọi trình	5	4	3	2	1	0
C5.4	Tìm kiếm và khắc phục các vấn đề liên quan đến kém chất lượng	5	4	3	2	1	0
C5.5	Đạt được các chỉ tiêu tài chính tốt (e.g. ROA, ROI)	5	4	3	2	1	0
C5.6	Có kế hoạch quản lí hàng ra vào và lưu tại bãi tốt	5	4	3	2	1	0

Sang phần 2 của phỏng vấn. Phần này có mục đích tìm hiểu về cơ cấu Giao Dục Đào Tạo và Trách Nhiệm Cộng Đồng của các cảng biển. Xin Ông/Bà cho biết ý kiến đánh giá dựa vào những bảng sau.

	C6. GIÁO DỤC & ĐÀO TẠO	VI	SI	I	SNI	NI	NA
C6.1	Giáo dục đào tạo được thực hiện đối với toàn bộ doanh nghiệp, từ ban lãnh đạo đến CBCNV	5	4	3	2	1	0
C6.2	Sử dụng các báo cáo tài chính, kiểm toán, báo cáo kết quả hoạt động sản xuất kinh doanh làm phương tiện đào tạo	5	4	3	2	1	0
C6.3	Cảng biển cần bảo đảm trình độ tay nghề của	5	4	3	2	1	0

	CBCNV đáp ứng yêu cầu của chuỗi bằng đào tạo thường xuyên						
C6.4	Công tác giáo dục đào tạo phải được thực hiện thường xuyên liên tục	5	4	3	2	1	0

	C7. TRÁCH NHIỆM CỘNG ĐỒNG	VI	SI	I	SNI	NI	NA
C7.1	Chính sách hiệu quả về an toàn nơi làm việc	5	4	3	2	1	0
C7.2	Cảng biển phải thực hiện qui định ISPS code và các chính sách an ninh cảng biển	5	4	3	2	1	0
C7.3	Trách nhiệm đóng góp vào lợi ích chung của xã hội và cộng đồng	5	4	3	2	1	0
C7.4	Triển khai chính sách bảo vệ môi trường	5	4	3	2	1	0
C7.5	Trách nhiệm với cộng đồng khu vực cảng biển hoạt động	5	4	3	2	1	0

C7.6 Theo ý kiến của Ông/Bà, các cảng biển và supply chain có thể thi hành những chính sách nào khác nữa để đóng góp cho cộng đồng? (: tạo công ăn vệc làm cho người lao động; sắp xếp những buổi giao lưu, từ thiện.)

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Phần tiếp theo sẽ liên quan đến các khoa Quản lí quy trình. Đây là vấn đề về vận chuyển hàng hóa, vận chuyển kinh tế và vận chuyển thông tin trong supply chain. Xin Ông/Bà hãy cho biết ý kiến đóng góp thông qua bảng dưới đây.

	C8. QUẢN LÍ QUY TRÌNH	VI	SI	I	SNI	NI	NA
C8.1	Cảng biển cần xác định các qui trình trọng tâm của chuỗi supply chain	5	4	3	2	1	0
C8.2	Các cảng cần hiểu rõ các quy trình trọng tâm để tránh hoang phí thời gian và nhân công	5	4	3	2	1	0
C8.3	Tiêu chuẩn hóa các qui trình, qui phạm	5	4	3	2	1	0
C8.4	Tăng cường tốc độ phản ứng để kịp thời với sự thay đổi của nhu cầu khách hàng	5	4	3	2	1	0
C8.5	Có khả năng kiểm soát rủi ro	5	4	3	2	1	0
C8.6	Áp dụng các công cụ và phương thức quản lý thích hợp giảm thiểu các chi phí	5	4	3	2	1	0
C8.7	Đẩy mạnh khả năng kiểm soát nghẽn tắc giao	5	4	3	2	1	0
C8.8	Khả năng sẵn sàng phục vụ của trang thiết bị và phương tiện cảng	5	4	3	2	1	0
C8.9	Chia sẽ kiến thức và kinh nghiệm các qui trình hoạt động chính với các doanh nghiệp Chuỗi	5	4	3	2	1	0
C8.10	Áp dụng hệ thống ứng phó với các sự cố (thay đổi đơn hàng, hoặc hệ thống máy tính trục trặc)	5	4	3	2	1	0
C8.11	Khả năng dự báo chính xác thị trường	5	4	3	2	1	0

C8.12 Theo kinh nghiệm của Ông/Bà, cảng biển có thể sử dụng thêm những yếu tố nào nữa trong quản lí quy trình để góp phần tăng cường hiệu quả chung cho toàn Chuỗi?

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Chất Lượng Hòa Nhập là một trong những yếu tố mới ảnh hưởng đến sự làm việc của các cảng biển. Xin Ông/Bà hãy đóng góp ý kiến thông qua bảng dưới đây

	C9. CHẤT LƯỢNG HÒA NHẬP	VI	SI	I	SNI	NI	NA
C9.1	Cảng biển lựa chọn doanh nghiệp mới tham gia chuỗi supply chain dựa trên chất lượng sản phẩm và dịch vụ mà doanh nghiệp này cung ứng	5	4	3	2	1	0
C9.2	Cảng biển cam kết hợp tác và phối hợp với các doanh nghiệp trong chuỗi lâu dài bằng văn bản	5	4	3	2	1	0
C9.3	Hỗ trợ tư vấn liên quan đến khai thác, kỹ thuật, tài chính cho các doanh nghiệp trong Chuỗi	5	4	3	2	1	0
C9.4	Cảng biển và các doanh nghiệp trong chuỗi cần cam kết cung cấp dịch vụ có cùng chất lượng tương đương	5	4	3	2	1	0
C9.5	Có sự phối kết hợp tốt giữa cảng và các doanh nghiệp trong chuỗi từ hoạch định chiến lược, khai thác đến triển khai hoạt động cụ thể	5	4	3	2	1	0
C9.6	Cắt cử nhóm chuyên trách liên doanh nghiệp cho công tác chất lượng	5	4	3	2	1	0

C9.7 Ông/Bà có nhận định cảng biển nên đảm bảo chắc chắn về năng lực của nhân viên đáp ứng yêu cầu của doanh nghiệp chính trong Chuỗi? Tại sao?

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C9.8 Ông/Bà có ý kiến gì về nhận định sau: mối liên hệ giữa các cảng biển và các doanh nghiệp nên dựa vào sự tin cậy lẫn nhau thay vì các hợp đồng cam kết?

Tôi muốn xin ý kiến của Ông/Bà trong vấn đề Tối Ưu Mạng Lưới. Xin Ông/Bà hãy sử dụng bảng sau để cho đánh giá dựa trên mức độ đồng tình.

	C10. TỐI ƯU HÓA MẠNG LƯỚI	VI	SI	I	SNI	NI	NA
C10.1	Cảng biển cần được thiết kế hoạt động trong mạng lưới supply chain hiệu quả và tối ưu	5	4	3	2	1	0
C10.2	Cơ cấu của các cảng biển cần gọn nhẹ để giảm thiểu chi phí	5	4	3	2	1	0
C10.3	Áp dụng chính sách bảo đảm chất lượng chung bắt buộc cho tất cả các doanh nghiệp tham gia	5	4	3	2	1	0
C10.4	Tăng khả năng kiểm soát trong Chuỗi (track inventory, orders to avoid bullwhip effects)	5	4	3	2	1	0
C10.5	Tăng cường khả năng thích ứng voi thay doi	5	4	3	2	1	0
C10.6	Sử dụng hệ thống điện tử (paperless)để giảm thiểu chi phí và tăng tính hiệu quả	5	4	3	2	1	0
C10.7	Giảm ảnh hưởng ngược của chuỗi cung ứng	5	4	3	2	1	0

*C10.*8 Để giảm thiểu ảnh hưởng tiêu cực đến lưu thông hàng hóa, cảng biển nên cân nhắc trước khi tham gia vào một chuỗi supply chain phức tạp, bao gồm nhiều doanh nghiệp, xin hãy cho biết ý kiến của Ông/Bà về vấn đề này.

Một phần tiếp theo được nhắc đến trong buổi phỏng vấn này liến quan đến vấn đề Công Nghệ Thông Tin. Xin Ông/Bà hãy cho biết ý kiến đánh giá thông qua bảng sau:

	C11. CÔNG NGHỆ-THÔNG TIN	VI	SI	I	SNI	NI	NA
C11.1	Cảng biển cần áp dụng hệ thống thông tin liên lạc hiện đại trong nội bộ doanh nghiệp cảng	5	4	3	2	1	0
C11.3	Việc trao đổi thông tin giữa các doanh nghiệp chuỗi phải thường xuyên và hiệu quả	5	4	3	2	1	0
C11.4	Cảng biển và các doanh nghiệp chuỗi sử dụng một mạng nội bộ của chuỗi supply chain để thuận lợi và bảo mật thông tin	5	4	3	2	1	0
C11.5	Cảng biển cần áp dụng hệ thống nhận diện thông minh hoặc tự động (mã vạch) để thuận tiện cho lưu thông hàng hóa	5	4	3	2	1	0
C11.6	Khả năng lấy được thông tin thích hợp từ chuỗi	5	4	3	2	1	0
C11.7	Sẵn sàng chia sẻ các thông tin cần thiết với các doanh nghiệp trong Chuỗi	5	4	3	2	1	0

C11.8 Ông/Bà có đánh giá gì về ý kiến sau: các cảng biển nên thu thập thông tin cần thiết từ những doanh nghiệp trong chuỗi để có thể dễ dàng nhận diện những vấn đề trong tương lai?

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Văn Hóa Chất Lượng là một vấn đề không nhỏ đối với tất cả các doanh nghiệp đang hoạt động trong thời buổi kinh tế đa quốc gia như hiện nay. Xin Ông/Bà hãy cho biết ý kiến đóng góp dựa theo sự đồng tình trong bảng dưới đây:

	C12. VĂN HÓA CHẤT LƯỢNG	VI	SI	I	SNI	NI	NA
C12.1	Xây dựng sự tin tưởng và cởi mở giữa các doanh nghiệp trong chuỗi	5	4	3	2	1	0
C12.2	Xây dựng hình ảnh cảng biển và chuỗi supply chain có chất lượng dịch vụ cao	5	4	3	2	1	0
C12.3	Xây dựng hình ảnh đáng tin cậy cho doanh nghiệp cảng và cho chuỗi supply chain	5	4	3	2	1	0
C12.4	Cảng và các doanh nghiệp trong chuỗi cung cấp các dịch vụ rẻ và tốt hơn các đối thủ cạnh tranh	5	4	3	2	1	0

C12.5 Theo Ông/Bà, có hay không sự khác biệt văn hóa giữa các doanh nghiệp tham gia chuỗi supply chain toàn cầu? Nếu có, các cảng biển có thể làm gì để tối thiểu hóa ảnh hưởng của sự khác biệt này?

.....
.....

C13. Dưới đây là 12 thuộc tính nâng cao chất lượng dịch vụ sử dụng cho cảng biển khi tham gia hoạt động trong supply chain. Đề nghị Ông/Bà đánh giá mức độ quan trọng bằng cách đánh số từ 1 đến 12 trong đó 1 là quan trọng nhất.

Vai trò lãnh đạo	❒	Hướng Tới Khách Hàng	❒
Quản Lí Nhân Lực	❒	Cải Tiến Chất Lượng	❒
Đo Lường Chất Lượng	❒	Giáo Dục & Đào Tạo	❒
Trách Nhiệm Cộng Đồng	❒	Quản Lí Quy Trình	❒
Chất Lượng Hòa Nhập	❒	Tối Ưu Hóa Mạng Lưới	❒
Công Nghệ-Thông Tin	❒	Văn Hóa Chất Lượng	❒

C14. Xin Ông/Bà cho biết Ông/Bà có muốn nhận kết quả của nghiên cứu này?

Có ❒$_{01}$

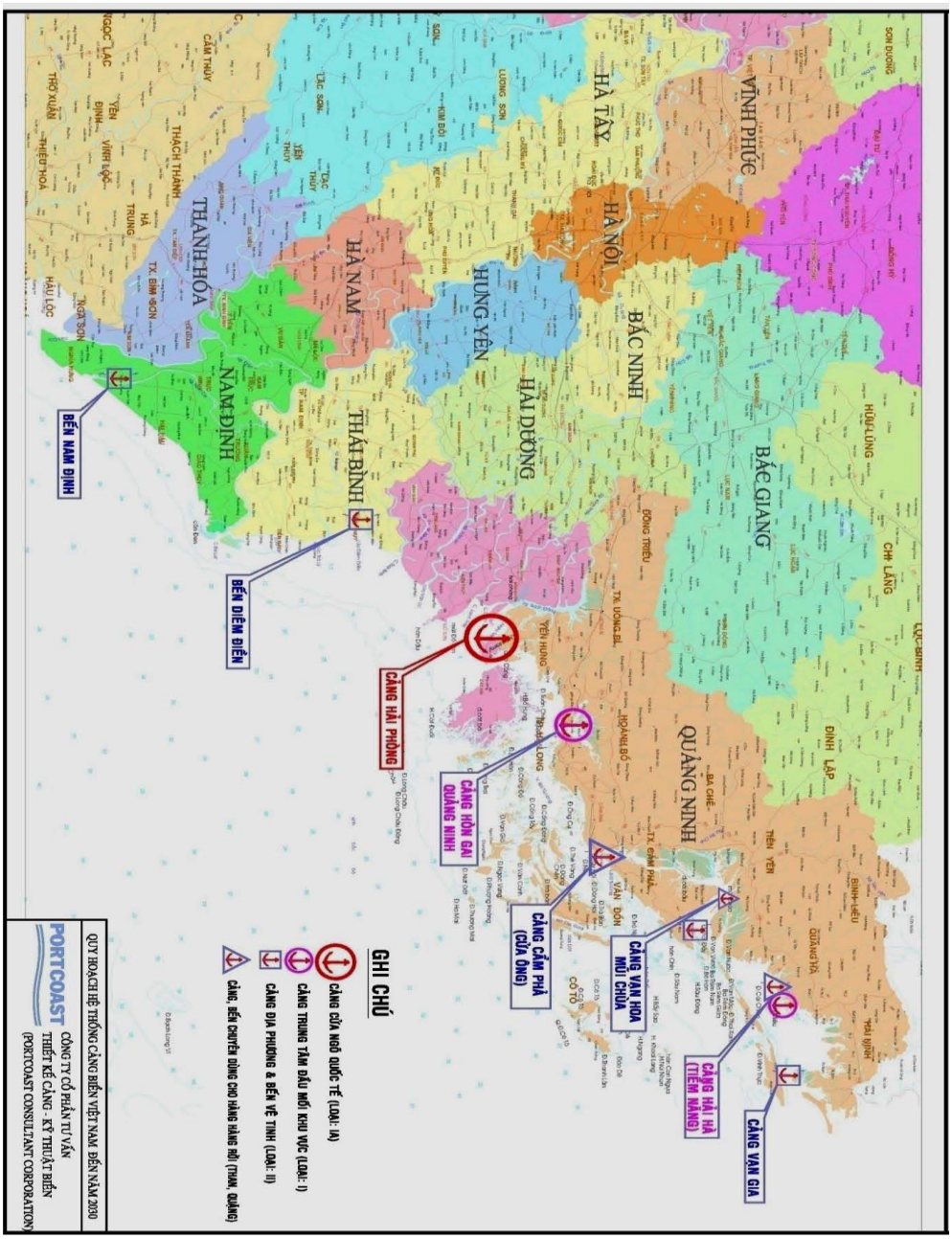
Email …….... ❒$_{02}$

Không ❒$_{03}$

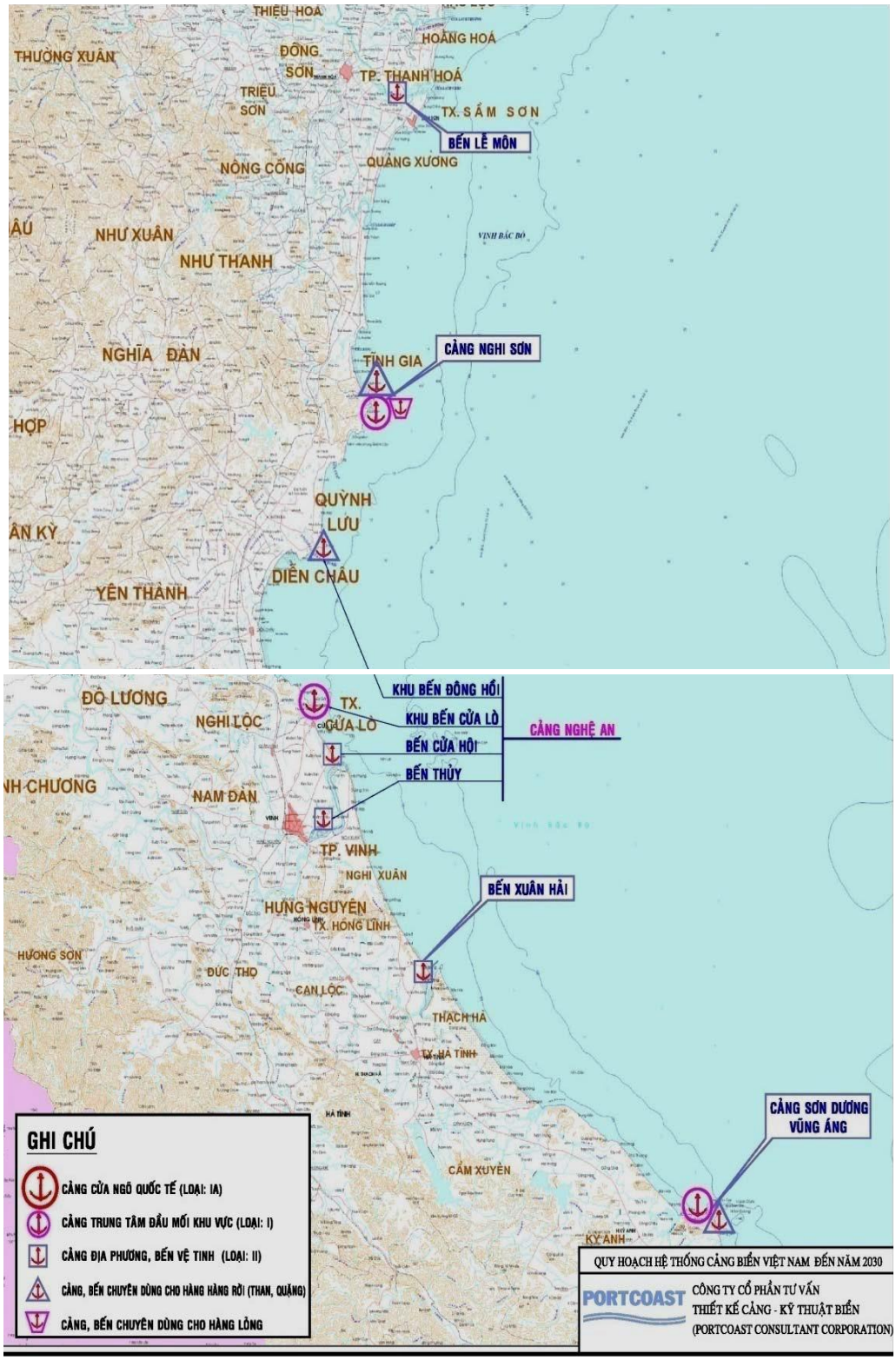
Xin trân trọng cảm ơn Ông/Bà đã đóng góp ý kiến quan trọng vào nghiên cứu này!

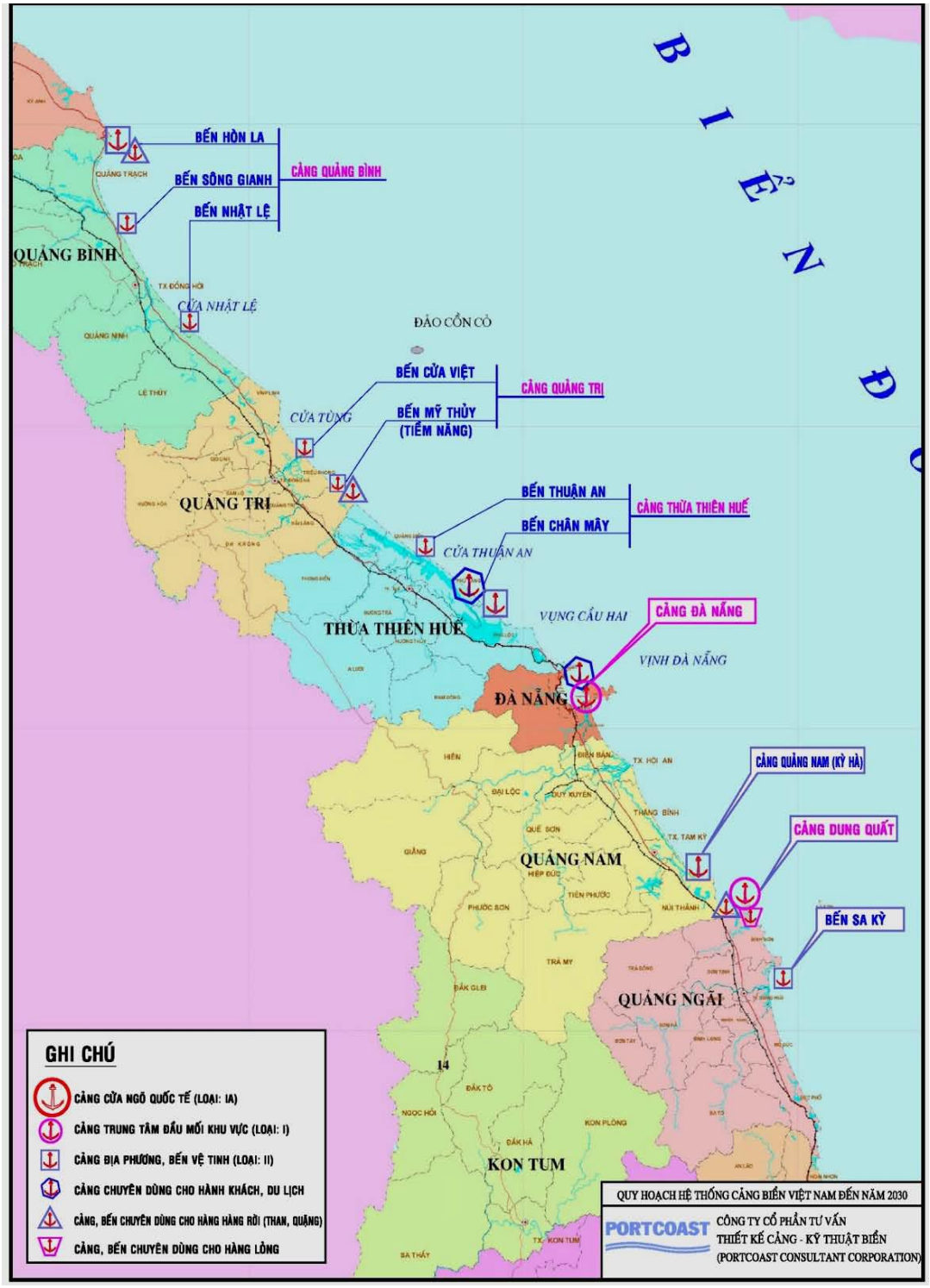
APPENDIX Q. THE DEVELOPMENT PLAN FOR VIETNAM SEAPORT

Section A. THE DEVELOPMENT PLAN FOR NORTHERN SEAPORTS

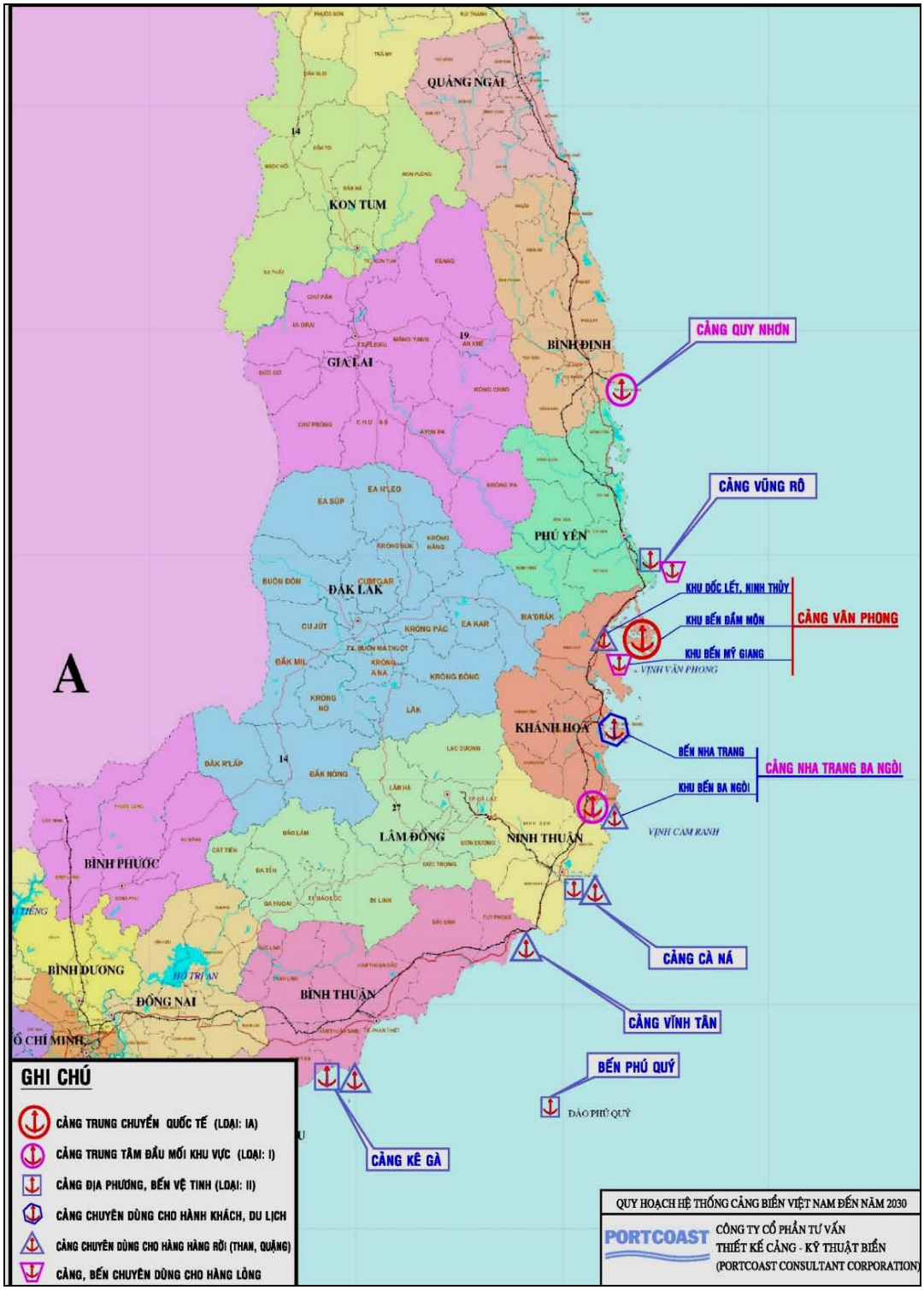


Section B. THE DEVELOPMENT PLAN FOR CENTRAL SEAPORTS




BIỂN ĐÔ
BẾN HÒN LA
BẾN SÔNG GIANH
CẢNG QUẢNG BÌNH
BẾN NHẬT LỆ
QUẢNG BÌNH
CỬA NHẬT LỆ
ĐẢO CỒN CỎ
BẾN CỬA VIỆT
CẢNG QUẢNG TRỊ
BẾN MỸ THỦY
(TIỀM NĂNG)
CỬA TÙNG
QUẢNG TRỊ
BẾN THUẬN AN
CẢNG THỪA THIÊN HUẾ
BẾN CHÂN MÂY
CỬA THUẬN AN
VỤNG CẦU HAI
CẢNG ĐÀ NẴNG
THỪA THIÊN HUẾ
VỊNH ĐÀ NẴNG
ĐÀ NẴNG
CẢNG QUẢNG NAM (KỲ HÀ)
CẢNG DUNG QUẤT
QUẢNG NAM
BẾN SA KỲ
QUẢNG NGÃI
KON TUM
GHI CHÚ
CẢNG CỬA NGÕ QUỐC TẾ (LOẠI: IA)
CẢNG TRUNG TÂM ĐẦU MỐI KHU VỰC (LOẠI: I)
CẢNG ĐỊA PHƯƠNG, BẾN VỆ TINH (LOẠI: II)
CẢNG CHUYÊN DÙNG CHO HÀNH KHÁCH, DU LỊCH
CẢNG, BẾN CHUYÊN DÙNG CHO HÀNG HÀNG RỜI (THAN, QUẶNG)
CẢNG, BẾN CHUYÊN DÙNG CHO HÀNG LỎNG
QUY HOẠCH HỆ THỐNG CẢNG BIỂN VIỆT NAM ĐẾN NĂM 2030
PORTCOAST
CÔNG TY CỔ PHẦN TƯ VẤN
THIẾT KẾ CẢNG - KỸ THUẬT BIỂN
(PORTCOAST CONSULTANT CORPORATION)

Section C. THE DEVELOPMENT PLAN FOR SOUTHERN SEAPORTS



APPENDIX R. DATA ANALYSIS

Section A. Seaport demographic information

No	Port name	Throughput 2009		Throughput 2010		Main activities				QM	Ownership	
		MT	TEUs	MT	TEUs	Bulk	Cont.	General	Petro			
A	**Northern region**	**48,766,410**	**1,769,627**	**55,748,094**	**1,377,387**							
1	Quang Ninh	4,736,184	185,235	5,853,000	204,129	✓	✓	✓			VINALINES	SO
2	Cam Pha	10,714,000		21,230,586		✓					Vinacoal	SO
3	Hai Phong	14,370,000	816,000	15,688,689	953,646		✓	✓	✓		VINALINES	SO
4	Dinh Vu	3,254,420	359,000	3,760,000			✓				VINALINES	SS
5	Doan Xa	4,300,000	250,000	1,597,217	219,612	✓	✓				VINALINES	SS
6	Vat Cach	1,323,373		1,268,000				✓	✓		VINALINES	SS
7	Cua Cam	530,000	7,000	426,117		✓					Haiphong Urban	LGO
8	Transvina	1,676,246	152,392	1,586,547							VINALINES	SS
9	Xang Dau B12	7,862,187		4,337,938					✓		Vinapetro	SO
B	**Central region**	**14,039,482**	**142,229**	**15,594,627**	**202,983**							
10	Thanh Hoa	282,000		246,000								
11	Nghe Tinh	1,249,370	3,918	1,595,182	14,213			✓			VINALINES	SS
12	Song Han 9	786,139										LGO
13	Vung Ang	786,139		815,000							Ha Tinh Mineral	SS
14	Quang Binh	87,993		78,646								LGO
15	Cua Viet	84,474		78,979								Ministry
16	Thuan An	120,000		100,000								SO
17	Da Nang	3,132,343	69,720	3,303,036	89,199		✓	✓	✓		VINALINES	SS
18	Nguyen V Troi	166,000		136,698								SS
19	Ky Ha	300,000		278.382				✓			Quang Ngai Urban	LGO
20	Ky Ha-Quang Nam	40,000	10,000	594,000	24,774		✓	✓			Ministry of Defence	SS
21	Hai Son	214,000		248,000								
22	Quy Nhon	3,855,679	54,649	4,501,555	72,224	✓	✓	✓			VINALINES	LGSH
23	Thi Nai	644,207		465,450				✓			VINALINES	Ministry
24	Nha Trang	1,333,446	3,942	1,042,778	2,573			✓			VINALINES	SS
25	Cam Ranh	1,256,913		1,486,639				✓			KhanhHoa	SS
26	Chan May	1,003,000		1,350,000				✓			VINALINES	Ministry
27	Vung Ro	438,385		440,709				✓			Phu Yen province	SO
C	**Southern region**	**92,715,175**	**3,486,246**	**80,930,619**	**4,182,096**							

28	Binh Minh	250,000		275,000		✓		✓			HoangQuan	Ministry
29	Phu My	3,132,615		5,213,054				✓			Batia Serece J.S	Ministry
30	Cai Cui	4,340,000		4,501,450	1,373		✓	✓			VINALINES	SS
31	Dong Nai	2,365,992		2,342,738			✓	✓			VINALINES	SS
32	Tan Cang SG	33,000,000	2,460,000	31,132,325	2,850,000		✓				Defence Ministry	SS
33	Cang SG	14,008,122	378,226	11,815,545	401,982	✓	✓	✓			VINALINES	LGSH
34	Ben Nghe	4,353,556	140,922	4,411,696	210,549						VINALINES	LGO
35	Binh Duong	600,000	60,000	531,687	96,538	✓	✓	✓			BinhDuong province	LGO
36	Tan Nhuan Dong	695,979		531,643				✓			VINAMARINE	SS
37	Cang Rau Qua	299,292	295	207,714		✓		✓			Agriculture Ministry	LGSH
38	Xang Dau Cat Lai	1,971,470		897,051					✓		Petec Co	SS
39	Saigon Petro	982,891		940,000					✓		Saigon Petro	LGO
40	Xang Dau Nha Be	4,700,000		4,500,000					✓		Petrolimex Saigon	Ministry
41	Bong Sen/Lotus	1,126,942	23,896	852,750	4,498		✓	✓			Lotus J.V. Co.	Ministry
42	My Tho	210,132		263,052			✓	✓			MyTho province	Ministry
43	Dong Thap	242,000		236,194								
44	Vinh Long	255,121		366,150	550			✓			Vinh Long Province	SO
45	Can Tho	7,532,827	8,052	1,276,488	4,825		✓	✓			VINALINES	SO
46	Ben Dam-Con Dao	265,000		151,162								SO
47	Vung Tau	578,318		608,395				✓			Vung Tau J.S.co.	SS
48	Tra Noc	4,409,000		1,132,287				✓			VINAFOOD II	SS
49	An Giang	3,275,306	18,855	1,658,103	20,308			✓			An Giang province	SS
50	VICT	3,300,000	300,000	3,146,547	297,561		✓				Joint venture	LGO
51	Shipbuilding	72,000		74,000								SS
52	Interflour Cai Mep	271,612		800,000							Interflour Vietnam	SO
53	CaiMep International											SS
54	SPCT-Container SG	1,056,000	96,000	3,526,944	293,912		✓	✓			Joint venture	LGO
55	Tan cang-Caimep											SS
	12 excluded seaports	*2,319,606*		*1,612,731*								
Target	43 sampling seaports	153,466,461	5,398,102	151,074,823	5,762,466							
VPA	55 seaports	155,521,067	5,398,102	152,273,340	5,762,466							

Legend:

LGO : Local government ownership
LGSO: Local government shareholding ownership
SO: State ownership
SS: Shareholding seaports

Section B. The perceptions on the proposed quality management practices framework

Seaport	QUALITY MANAGEMENT FOR SEAPORTS IN SUPPLY CHAINS																								
	Leadership						Customer focus					Information technology						Human resource							Major	Degree
No.	L1	L2	L3	L4	L5	L6	C1	C2	C3	C4	C5	IT1	IT2	IT3	IT4	IT5	IT6	HR1	HR2	HR3	HR4	HR5	HR6	HR7		
1	5	4	2	3	4	3	4	4	4	3	2	5	4	4	4	4	2	3	2	2	5	3	2	2	Opr	BA
2	5	5	4	5	4	3	5	4	5	5	3	4	5	4	3	5	4	4	5	5	4	4	2	4	Man	MSc
3	4	5	5	4	5	5	5	4	5	4	2	5	4	4	4	5	3	4	5	5	4	4	3	4	Opr	BA
4	5	5	4	5	4	3	5	4	5	5	3	5	5	5	3	4	3	2	5	5	3	4	3	4	Eng	Dip
5	5	3	3	4	5	3	4	5	5	4	2	5	3	5	3	3	4	4	4	3	4	3	2	4	Eng	BA
6	5	5	5	4	5	5	5	4	5	4	3	5	4	4	4	3	4	2	5	4	4	5	4	4	Other	Dip
7	5	4	5	5	5	4	5	4	5	4	2	4	3	4	4	4	4	3	4	5	4	4	3	5	Opr	BA
8	5	3	2	3	4	3	4	4	4	3	1	4	4	3	3	4	3	3	3	2	5	3	2	2	Other	Dip
9	4	4	3	3	4	4	4	3	4	3	2	5	3	3	4	4	4	3	4	4	3	2	2	3	Man	MSc
10	3	3	3	3	3	3	4	4	4	4	2	4	4	4	3	3	3	2	4	3	4	3	4	4	Opr	MSc
11	3	3	3	3	3	3	4	4	4	4	3	5	3	3	4	4	4	4	4	3	4	3	4	4	Eng	MSc
12	5	4	3	4	3	3	5	3	2	4	3	4	4	4	4	4	3	3	4	4	3	5	4	3	Man	BA
13	5	4	4	4	4	4	3	4	4	4	4	5	3	4	4	4	2	2	4	3	3	3	3	3	Opr	MSc
14	3	3	3	3	3	3	4	4	4	4	3	5	4	3	3	5	4	4	4	3	4	3	4	4	Opr	BA
15	3	3	5	5	3	5	5	5	4	4	3	5	3	4	4	5	2	3	5	4	3	5		5	Other	BA
16	5	4	5	3	4	3	4	5	4	5	4	4	4	4	3	4	4	4	3	3	4	4	3	2	Eng	Dip
17	4	5	5	4	5	3	5	4	5	4	4	5	3	3	4	3	4	4	2	5	4	4	3	4	Opr	BA
18	5	4	4	3	4	5	5	5	5	4	3	5	4	3	4	5	4	3	3	4	4	3	3	3	Man	PhD
19	4	5	5	5	5	4	5	5	4	5	4	5	4	4	5	4	4	5	3	5	3	4	3	3	Opr	BA
20	4	5	4	3	4	5	5	4	5	4	3	5	4	3	4	4	3	4	2	4	5	3	4	4	Eng	MSc
21	5	4	5	5	5	4	5	5	4	5	4	4	5	4	3	4	4	4	3	5	4	4	3	4	Opr	BA
22	5	5	5	4	4	3	5	4	5	4	4	5	5	4	4	4	4	2	2	5	5	4	3	4	Eng	MSc
23	4	5	5	3	5	4	5	5	5	5	4	5	4	3	5	5	3	4	4	5	3	4	3	4	Man	BA
24	5	3	3	3	4	3	4	5	4	3	3	4	4	3	4	4	3	3	3	4	5	3	3	2	Eng	BA
25	5	3	3	3	4	4	4	4	4	3	4	5	3	3	4	5	4	3	3	4	5	3	4	2	Man	BA
26	4	4	5	3	4	3	4	5	5	4	4	5	4	3	4	5	2	3	4	4	4	3	3	4	Eng	BA

Seaport	Leadership						Customer focus					Information technology						Human resource							Major	Degree
	L1	L2	L3	L4	L5	L6	C1	C2	C3	C4	C5	IT1	IT2	IT3	IT4	IT5	IT6	HR1	HR2	HR3	HR4	HR5	HR6	HR7		
27	4	5	5	4	5	5	5	4	5	5	5	5	4	5	4	4	4	4	3	5	4	4	3	4	Opr	BA
28	4	5	5	4	4	4	4	5	4	4	3	5	5	4	4	5	3	5	2	5	5	5	4	4	Man	BA
29	5	4	4	4	5	5	5	4	4	5	3	4	5	5	4	5	3	5	4	5	4	4	4	4	Opr	BA
30	4	5	5	3	5	4	5	5	5	5	3	5	4	4	3	4	2	2	4	5	3	4	3	5	Eng	Dip
31	5	3	4	5	4	3	5	4	5	5	3	5	4	4	5	5	4	3	3	5	3	4	3	4	Eng	BA
32	5	4	4	4	4	4	3	4	4	5	2	5	3	4	3	4	3	2	2	3	5	3	3	3	Opr	MSc
33	5	4	5	4	4	5	5	4	5	4	5	4	5	4	4	5	4	5	3	5	4	5	4	4	Opr	PhD
34	4	5	5	5	5	4	5	4	5	5	3	5	4	4	4	5	2	5	3	5	3	4	3	5	Man	BA
35	5	4	3	4	3	3	4	4	5	4	5	4	3	3	3	4	3	3	4	4	5	5	3	3	Man	MSc
36	5	4	5	3	3	4	5	4	5	5	4	5	4	2	4	4	2	5	3	4	4	4	3	4	Eng	BA
37	4	5	4	5	5	5	4	5	4	5	3	4	5	3	4	4	3	5	2	5	5	5	2	4	Opr	BA
38	5	4	4	4	4	4	3	4	4	4	4	3	3	4	4	4	3	2	4	3	5	3	3	3	Man	BA
39	5	4	5	3	3	5	5	4	5	5	5	5	4	2	4	5	3	5	3	5	5	5	4	5	Opr	BA
40	5	4	5	5	4	4	4	4	3	4	4	4	4	4	3	4	2	4	4	4	4	4	4	2	Man	BA
41	4	3	5	3	4	4	5	5	5	4	5	5	4	3	3	5	3	5	2	4	4	3	3	4	Man	BA
42	4	5	4	3	5	4	5	4	5	5	2	4	5	4	4	4	3	2	2	5	5	4	4	4	Eng	BA
43	5	4	5	4	4	4	4	4	3	4	4	5	4	3	2	4	3	4	5	2	4	3	3	3	Opr	BA

	L1	L2	L3	L4	L5	L6	C1	C2	C3	C4	C5	IT1	IT2	IT3	IT4	IT5	IT6	HR1	HR2	HR3	HR4	HR5	HR6	HR7
Mean	4.49	4.11	4.18	3.81	4.13	3.86	4.49	4.26	4.42	4.26	3.3	4.63	3.95	3.65	3.72	4.25	3.26	3.51	3.42	4.12	4.07	3.75	3.09	3.63
Standard deviation	0.66	0.76	0.93	0.79	0.71	0.77	0.63	0.54	0.69	0.66	0.98	0.54	0.69	0.72	0.63	0.62	0.74	1.05	0.98	0.95	0.74	0.78	0.81	0.87
Scale/percentage																								
Not important											2.3												2.3	
Slightly not important			4.7						2.3		8.6			4.7	2.3		18.6	20.9	20.9	7.0		2.3	14.0	14.0
Important	9.3	23.3	20.9	41.9	18.6	37.2	7.0	4.7	4.7	11.6	37.2	2.3	25.6	34.9	30.2	9.3	41.9	27.9	30.2	18.6	23.3	37.2	53.5	20.9
Slightly important	32.6	41.9	25.6	34.9	48.8	39.5	37.2	65.1	41.9	51.2	30.2	32.6	53.5	51.2	60.5	55.8	39.5	30.2	34.9	30.2	46.5	41.9	30.2	53.5
Very important	58.1	34.9	48.8	23.3	32.6	23.3	55.8	30.2	51.2	37.2	11.6	65.1	20.9	9.3	7.0	34.9		20.9	14.0	44.2	30.2	18.6		11.6

Seaport	Education				Quality integration						Process management										Performance					Work
No.	ED1	ED2	ED3	ED4	QI1	QI2	QI3	QI4	QI5	QI6	PM1	PM2	PM3	PM4	PM5	PM6	PM7	PM8	PM9	PM10	PF1	PF2	PF3	PF4	PF5	Expr.
1	3	3	3	4	4	5	3	3	4	4	3	4	4	3	4	2	3	4	2	4	3	4	4	2	3	4
2	4	3	4	4	4	4	4	5	5	3	4	5	5	3	3	3	4	4	2	4	3	4	3	3	4	11
3	3	4	3	3	3	4	4	3	3	4	4	5	4	3	3	3	4	4	3	3	4	4	4	3	3	8
4	3	3	4	4	4	4	4	5	5	3	4	5	5	4	5	2	3	3	1	4	3	4	3	3	2	6
5	4	4	5	5	4	5	5	3	3	3	4	5	4	3	4	1	3	4	1	3	4	4	2	4	2	5
6	4	4	4	4	5	4	4	2	4	3	4	4	5	4	3	3	4	3	1	4	5	3	3	4	3	9
7	4	3	4	4	5	3	5	4	4	4	5	4	4	4	4	1	3	4	2	4	5	4	4	3	4	4
8	4	4	3	4	5	5	5	3	3	4	3	4	4	4	5	2	4	4	1	3	3	4	3	2	4	2
9	2	3	4	3	5	4	3	5	5	3	3	3	4	3	4	2	3	3	1	4	4	4	3	4	3	4
10	4	5	5	4	4	5		3	4	5	4	3	5	3	4	1	3	4	2	4	4	4	3	3	3	9
11	4	5	5	4	5	4	4	4	3	3	4	4	4	3	4	3	3	4	3	3	4	4	4	4	3	12
12	4	5	2	5	4	3	5	4	3	4	3	5	5	3	4	2	4	3	1	3	2	2	3	2	3	9
13	4	4	1	3	4	5	3	4	4	3	5	5	4	5	3	1	3	3	2	4	4	4	4	4	3	15
14	4	5	5	4	3	3	4	5	4	4	4	4	5	3	4	1	4	4	1	3	4	4	4	3	4	4
15	4	4	2	5	4	3	4	4	3	4	5	4	5	4	4	2	3	4	2	3	4	3	3	4	3	8
16	4	3	4	3	3	5	3	3	5	2	4	4	4	4	4	4	5	4	3	4	4	4	4	2	3	6
17	4	2	4	4	4	4	3	4	3	3	4	4	4	4	4	4	5	4	2	4	5	3	3	4	4	6
18	3	3	3	3	4	4	4	3	4	2	5	4	4	4	4	3	4	4	2	4	4	3	2	4	4	18
19	4	2	4	4	5	5	3	3	4	3	4	5	3	5	5	2	5	3	2	5	4	4	3	2	4	9
20	3	4	5	3	4	4		4	4	3	5	4	4	5	4	3	4	3	3	4	5	3	2	4	4	10
21	4	3	4	4	3	5	3	3	5	4	5	4	3	4	4	3	4	4	3	4	4	3	4	5	4	4
22	4	4	5	3	5	4	4	5	5	4	4	4	3	5	5	3	4	3	2	3	5	3	3	4	3	11
23	4	4	4	4	3	3	4	3	3	3	4	5	3	4	4	2	5	4	2	4	4	2	3	5	3	9
24	3	3	3	4	4	5	3	5	4	3	3	4	4	5	4	3	3	3	3	4	4	3	3	3	4	12
25	3	3	5	4	4	5	3	4	3	2	3	4	3	5	3	4	5	4	2	5	3	2	4	3	3	11
26	4	3	3	3	3	4	4	4	4	3	5	4	4	3	3	3	4	4	3	4	4	3	4	4	3	5

Seaport	Education				Quality integration						Process management										Performance					Work
No.	ED1	ED2	ED3	ED4	QI1	QI2	QI3	QI4	QI5	QI6	PM1	PM2	PM3	PM4	PM5	PM6	PM7	PM8	PM9	PM10	PF1	PF2	PF3	PF4	PF5	Expr
27	3	2	5	3	4	4	4	5	5	3	4	5	4	3	4	2	4	4	3	4	4	4	3	3	4	9
28	4	3	4	2	3	4	3	4	4	3	4	4	3	4	3	2	5	5	3	5	5	3	4	4	4	7
29	4	4	4	4	2	4	4	4	3	3	4	4	3	4	5	3	5	5	3	5	5	3	4	4	4	6
30	4	4	5	4	4	3	4	3	4	2	4	5	4	5	4	3	3	4	3	5	4	2	4	5	4	7
31	3	3	4	2	4	4	3	3	3	2	4	5	3	4	4	2	4	4	2	4	3	3	4	3	3	15
32	4	4	5	3	3	5	2	3	3	3	5	5	3	5	3	2	4	4	2	5	4	3	2	4	5	8
33	4	4	4	4	3	4	3	3	4	3	4	4	3	4	4	3	4	3	3	5	3	3	2	4	5	16
34	4	3	3	4	4	4	3	3	4	3	4	5	4	5	3	3	4	3	2	3	4	2	2	3	4	6
35	4	5	2	2	3	4	3	3	3	2	4	5	3	5	4	4	4	3	2	4	4	3	3	2	3	15
36	4	4	5	3	4	5	3	4	4	2	5	5	3	4	3	3	3	4	3	4	3	3	3	5	4	9
37	5	3	3	3	3	5	3	3	2	2	5	5	4	5	3	3	4	4	2	3	3	2	2	4	3	5
38	4	4	3	3	4	5	3	4	3	3	5	5	2	4	4	3	3	3	2	4	4	2	4	4	4	8
39	4	4	5	3	3	4	3	2	3	3	5	5	2	5	3	3	5	4	3	4	4	2	4	3	4	7
40	4	2	3	3	3	4	3	3	4	2	4	4	4	4	4	4	3	4	3	4	3	3	2	4	3	5
41	5	3	4	3	3	4	4	3	3	3	4	5	3	5	3	2	4	3	3	3	4	4	3	4	4	3
42	5	3	3	4	4	5	3	3	4	2	5	5	3	4	4	3	3	4	2	4	3	2	2	3	4	7
43	4	4	4	1	2	5	4	3	2	2	3	3	3	3	4	2	2	4	3	3	3	4	4	4	4	3

	ED1	ED2	ED3	ED4	QI1	QI2	QI3	QI4	QI5	QI6	PM1	PM2	PM3	PM4	PM5	PM6	PM7	PM8	PM9	PM10	PF1	PF2	PF3	PF4	PF5
Mean	3.84	3.53	3.81	3.49	3.74	4.23	3.56	3.58	3.69	3	4.12	4.39	3.72	4.02	3.81	2.56	3.79	3.72	2.23	3.88	3.84	3.19	3.19	3.51	3.53
Standard deviation	0.59	0.83	1.01	0.83	0.79	0.68	0.7	0.82	0.8	0.76	0.68	0.62	0.79	0.77	0.63	0.85	0.77	0.54	0.72	0.66	0.72	0.76	0.76	0.85	0.66
Scale/percentage																									
Not important			2.3	2.3												11.6			16.3						
Slightly not important	2.3	9.3	7.0	7.0	43.7		2.3	4.7	4.7	25.6			4.7			32.6	2.3		44.2		2.3			14.0	4.7
Important	20.9	39.5	25.6	37.2	32.6	14.0	48.8	48.8	37.2	51.2	16.3	7.0	34.9	27.9	30.2	44.2	34.9	32.6	39.5	27.9	27.9	20.9	20.9	30.2	41.9
Slightly important	69.8	39.5	37.2	46.5	46.5	48.8	39.5	30.2	41.9	20.9	53.5	46.5	44.2	41.9	58.1	11.6	44.2	62.8		55.8	53.5	39.5	39.5	46.5	48.8
Very important	7.0	11.6	27.9	7.0	16.3	37.2	9.3	16.3	16.3	2.3	30.2	46.5	16.3	30.2	11.6		18.6	4.7		16.3	16.3	39.5	39.5	9.3	4.7

Seaport	Network optimise						Social benefits					Continuous improvement						Quality culture				Respondent position
No.	NW1	NW2	NW3	NW4	NW5	NW6	SB1	SB2	SB3	SB4	SB5	CI1	CI2	CI3	CI4	CI5	CI6	QC1	QC2	QC3	QC4	
1	3	4	3	4	4	4	4	3	1	3	3	3	3	3	2	3	2	4	2	4	3	Operation manager
2	4	4	2	5	4	3	5	3	2	3	3	3	3	4	3	3	3	4	2	3	3	Gen. managing director
3	5	5	2	5	5	4	4	4	2	3	3	4	4	3	2	3	3	3	3	4	3	Operation manager
4	4	4	2	4	4	3	5	3	3	3	3	3	3	3	3	3	2	4	2	4	3	Operation manager
5	5	5	2	4	4	4	4	3	1	4	4	4	3	3	2	4	3	3	2		4	Technical manager
6	4	4	2	4	4	4	4	4	3	4	3	4	3	4	2	3	2	4	3	4	4	Planning manager
7	4	5	3	4	4	4	4	4	2	4	3	3	4	3	3	3	3	4	2	4	3	Deputy manager
8	3	4	2		4	3	4	3	1	3	3	3	3	4	2	2	2	4	2	4	3	Market man. assistant
9	3	5	2	5	5	4	4	4	2	3	3	3	4	3	3	3	3	3	2	4	4	Planning manager
10	4	4	1	4	4	3	5	3	2	3	2	4	3	3	3	3	3	4	2	5	3	Operation manager
11	3	3	2	3	4	3	5	3		3	3	4	3	3	4	3	2	3	3	4	3	Technical manager
12	4	5	1	4	5	4	4	3	3	4	3	3	4	4	3	3	3	4	3	3	3	Planning manager
13	4	3	2	4	4	4	4	3	2	4	3	3	3	3	3	3	2	4	3	4	4	Deputy gen. director
14	3	4	3	5	4	4	5	3	3	3	3	4	4	4	3	4	2	3	2	4	3	Technical manager
15	4	5	3	4	3	3	4	3	1	4	4	3	3	3	2	2	2	3	2	4	3	Managing director
16	4	3	2	4	4	3	5	4	3	4	4	3	3	3	3	2	4	3	3	4	4	Technical manager
17	4	4	2	4	3	4	4	4	2	4	4	4	3	3	3	3	4	4	2		3	Deputy manager
18	5	5	4	5	5	4	4	3	3	3	3	4	3	4	3	4	3	4	3	4	4	Gen. managing director
19	5	4	1	4	4	3	3	4	2	3	4	4	3	3		3	3	4	2	5	4	Managing director
20	5	3	3	4	4	3	4	3	1	3	3	4	4	3	4	1	3	5	1	5	4	Deputy general director
21	4	5	3	5	5	3	5	4	2	4	3	3	3	4	4	3	3	4	2	4	3	Managing director
22	4	3	3		4	3	4	4	4	4	4	4	3	3	3	4	4	4	2	4	4	Deputy general director
23	5	4	3	4	3	3	5	4	3	5	4	3	4	3	3	3	3	3	3	3	3	Managing director
24	4	4	2	4	3	4	4	3	2	3	3	4	3	4	3	2	4	3	3	3	3	Deputy general director
25	3	4	2	3	5	4	4	3	3	3	3	4	3	3	3	2	4	3	3	4	4	Deputy general director
26	5	3	3	5	4	4	4	3		3	3	4	4	3	4	3	3	4	2	4	4	Technical manager

Seaport	Network optimise						Social benefits					Continuous improvement						Culture				Respondent position
No.	NW1	NW2	NW3	NW4	NW5	NW6	SB1	SB2	SB3	SB4	SB5	CI1	CI2	CI3	CI4	CI5	CI6	QC1	QC2	QC3	QC4	
27	5	5	3	5	3	4	4	3	3	3	3	4	4	3		3	3	4	2	3	4	Managing director
28	4	4	2	4	4	3	4	4	2	4	4	4	3	3	3	3	4	4	3	4	3	Managing director
29	4	4	2	4	5	4	4	3	4	4	4	4	4	5	4	3	4	4	2	3	3	Deputy gen. director
30	5	5	3	5	4	4	4	5		5	4	4	4	2	3	1	5	2	2	4	3	Technical manager
31	4	4	4	3	3	3	4	4	4	3	3	3	3	4	4	2	3	4	1	4	4	Gen. managing director
32	4	3	2	3	4	3	3	4	2	4	4	4	5	3	3	1	4	4	2	2	3	Managing director
33	4	4	3	4	3	4	4	4	4	4	3	2	3	5	3	1	4	4	2	3	3	Gen. managing director
34	5	4	3	5	4	2	3	5	3	5	3	3	5	3	3		3	2	1	4	3	Managing director
35	3	5	3	4	4	3	4	5	3	4	3	4	4	4	4	3	3	4	2	3	3	Gen. managing director
36	4	3	2		3	4	4	4	2	4	4	3	3	4	4	1	3	3	3	4	3	Deputy manager
37	5	5	2	5	4	4	5	4	3	5	4	3	5	4	4	4	2	3	3	3	3	Operation manager
38	4	3	3	3	3	3	4	4	2	4	3	3	4	2		1	4	4	2	3		Deputy manager
39	4	4	3	2	3	4	4	4	3	4	4	4	3	4	2	2	5	3	3	3	3	Operation manager
40	4	3	2	4	4	4	5	5	3	4	3	3	4	4	3	2	4	2	3	4	3	Managing director
41	3	4	2		3	4	4	4	2	5	4	4	5	4	4	3	4	3	1	3	3	Technical manager
42	5	4	3	4	4	3	3	4	2	5	3	4	4	4	4	4	2	2	2	4	3	Managing director
43	4	2	3	3	4	2	3	3	2	4	3	4	4	4	4	2	1	4	2	3	2	Technical manager

	NW1	NW2	NW3	NW4	NW5	NW6	SB1	SB2	SB3	SB4	SB5	CI1	CI2	CI3	CI4	CI5	CI6	QC1	QC2	QC3	QC4
Mean	4.09	4	2.44	4.02	3.91	3.49	4.09	3.6	2.39	3.74	3.42	3.53	3.56	3.44	3.14	2.67	3.09	3.51	2.25	3.69	3.28
SD	0.68	0.79	0.7	0.74	0.64	0.59	0.57	0.69	0.87	0.69	0.54	0.55	0.67	0.67	0.68	0.92	0.89	0.7	0.62	0.64	0.5
Scale/percentage																					
Not important			7.0						16.3							14.0	2.3		9.3		
Slightly not important		2.3	46.5	2.3		4.7		2.3	37.2		2.3	2.3		4.7	16.3	20.9	23.3	9.3	55.8	2.3	2.3
Important	18.6	23.3	41.9	18.6	25.6	41.9	11.6	44.2	37.2	39.5	53.5	41.9	53.5	51.2	53.5	48.8	41.9	32.6	34.9	32.6	67.4
Slightly important	53.5	46.5	4.7	53.5	58.1	53.5	67.4	44.2	9.3	46.5	44.2	55.8	37.2	39.5	30.2	16.3	27.9	55.8		58.1	30.2
Very important	27.9	27.9		25.6	16.3		20.9	9.3		14			9.3	4.7			4.7	2.3		7.0	

Section C. The perception comparison between two survey stages

	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence	
						Lower	Upper
LD1	1.357	36	.183	.31579	.23275	-.15624	.78782
LD2	2.251	36	.031	.57895	.25724	.05723	1.10066
LD3	1.580	36	.123	.47368	.29979	-.13432	1.08169
LD4	3.113	36	.004	.73684	.23668	.25683	1.21685
LD5	1.208	36	.235	.31579	.26140	-.21435	.84593
C1	2.333	36	.025	.36842	.15789	.04820	.68865
C2	.000	36	1.000	.00000	.17368	-.35223	.35223
C3	3.104	36	.004	.57895	.18649	.20072	.95717
C4	.303	36	.764	.05263	.17368	-.29960	.40486
IT1	-1.485	36	.146	-.26316	.17718	-.62250	.09619
IT5	1.085	36	.285	.26316	.24246	-.22858	.75489
HR1	-.657	36	.516	-.21053	.32063	-.86079	.43973
HR2	4.110	36	.000	1.10526	.26894	.55982	1.65070
HR3	2.187	36	.035	.63158	.28881	.04585	1.21731
HR4	-.750	36	.458	-.21053	.28070	-.77982	.35876
HR5	1.611	36	.116	.42105	.26140	-.10909	.95119
HR6	.204	36	.839	.05263	.25784	-.47029	.57556
HR7	2.127	36	.040	.52632	.24749	.02439	1.02824
EDU1	-.909	36	.369	-.15789	.17368	-.51012	.19434
EDU2	.614	36	.543	.15789	.25724	-.36382	.67961
EDU3	-.728	36	.472	-.21053	.28934	-.79734	.37628
EDU4	.000	36	1.000	.00000	.20979	-.42548	.42548
QI1	-2.226	36	.032	-.89474	.40198	-1.70999	-.07948
QI2	-1.048	36	.302	-.31579	.30133	-.92691	.29533
QI3	.347	36	.731	.10526	.30336	-.50998	.72051
QI4	-.498	36	.621	-.15789	.31676	-.80032	.48453
PM3	.516	36	.609	.10526	.20384	-.30815	.51867
PM4	1.732	36	.092	.36842	.21271	-.06297	.79981
QF1	1.263	36	.215	.31579	.24996	-.19116	.82273
QF2	3.616	36	.001	.94737	.26199	.41604	1.47870
QF3	-.132	36	.896	-.05263	.39852	-.86087	.75560
QF4	2.157	36	.038	.57895	.26837	.03467	1.12323
NW1	.567	36	.574	.15789	.27850	-.40693	.72272
NW3	8.167	36	.000	1.78947	.21912	1.34507	2.23388
NW6	-1.547	36	.131	-.26316	.17009	-.60812	.08181
SB1	-.516	36	.609	-.10526	.20384	-.51867	.30815
SB2	1.779	36	.084	.42105	.23668	-.05896	.90106
SB3	1.706	36	.097	.57895	.33928	-.10915	1.26704
SB4	.815	36	.421	.15789	.19378	-.23511	.55090
SB5	1.818	36	.077	.31579	.17368	-.03644	.66802
CI1	-.751	36	.457	-.21053	.28015	-.77870	.35765
CI2	8.904	36	.000	1.47368	.16551	1.13802	1.80935
CI3	4.409	36	.000	.94737	.21487	.51160	1.38314
CI4	7.188	36	.000	1.42105	.19771	1.02008	1.82203
CI5	1.765	36	.086	.68421	.38756	-.10179	1.47021
CI6	3.520	36	.001	.84211	.23927	.35685	1.32736
QC3	2.148	36	.039	.47368	.22052	.02644	.92093

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Appendix S

Quality management for seaports integrated in supply chains

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Hai Tran; Stephen Cahoon; Shu-Ling Chen, 2012. Quality management for seaports integrated in supply chains. *International Journal of Shipping and Transport Logistics (IJSTL), 4, (4).*